Rancho Palma

NOISE IMPACT ANALYSIS

CITY OF SAN BERNARDINO

PREPARED BY:

Bill Lawson, PE, INCE
blawson@urbanxroads.com
(949) 660-1994 x203

Alex Wolfe
awolfe@urbanxroads.com
(949) 660-1994 x209

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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
I-215	Interstate 215
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
PPV	Peak Particle Velocity
Project	Rancho Palma
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

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EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Rancho Palma development ("Project"). The Project site is located northeast of West Little League Drive and northwest of Palm Avenue in the City of San Bernardino. The Project is proposed to consist of the development of up to 120 single-family detached residential dwelling units and 98,000 square feet of commercial retail use. This study has been prepared to satisfy the City of San Bernardino noise standards and to ensure that adequate noise abatement measures are incorporated into the Project's development.

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the proposed Project will influence the traffic noise levels in surrounding off-site areas. To quantify the off-site traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on 32 roadway segments surrounding the Project site were estimated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in the *Rancho Palma Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (1) To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing, Existing plus Ambient (2018), Existing plus Ambient (2019), Opening Year Cumulative (2018), Opening Year Cumulative (2019), and Year 2035 traffic conditions. The off-site traffic noise analysis indicates that the Project's contributions to roadway noise levels at adjacent sensitive land uses will be *less than significant* for Existing, Existing plus Ambient (2018), Existing plus Ambient (2019), Opening Year Cumulative (2018), Opening Year Cumulative (2019), and Year 2035 conditions.

ON-SITE TRAFFIC NOISE ANALYSIS

The results of this analysis indicate that future vehicle noise from the I-215 Freeway, West Little League Drive, and Magnolia Avenue is the principal source of community noise that will impact the Project site. The Project will also experience some background traffic noise impacts from the Project's internal roads, however due to the distance, topography and low traffic volume/speeds, traffic noise from these roads will not make a significant contribution to the noise environment. The on-site noise mitigation measures recommended in this noise analysis have been designed to reduce the exterior and interior noise levels to satisfy the City of San Bernardino transportation related CNEL noise criteria for residential development. With the recommended noise mitigation measures shown on Exhibit ES-A, the on-site noise impacts will be *less than significant*.

EXTERIOR NOISE MITIGATION

To satisfy the City of San Bernardino 65 dBA CNEL exterior noise level standards for residential land use, the construction of a minimum effective 9-foot high noise barrier is required for the outdoor living areas (backyards) of lots 47 to 55 and 75 to 81 facing the I-215 Freeway and West Little League Drive. The planned noise barrier is expected to consist of a combination 1 foot high berm with an 8 foot high block wall. In addition, the construction of a minimum effective 7-foot

high noise barrier is required for lot 82 facing West Little League Drive. Further, 6-foot high noise barriers are recommended for all other lots adjacent to Magnolia Avenue and the commercial retail land use of the Project site. With the recommended noise barriers shown on Exhibit ES-A, the mitigated future exterior noise levels will range from 48.8 to 65.0 dBA CNEL. This noise analysis shows that the recommended noise barriers will satisfy the City of San Bernardino 65 dBA CNEL exterior noise level standards. The effective noise barrier height recommendations represent the minimum wall and/or berm combination height required to satisfy the City of San Bernardino exterior noise level standards.

The recommended noise control barriers shall be constructed so that the top of each wall and /or berm combination extends to the recommended height above the pad elevation of the lot it is shielding. When the road is elevated above the pad elevation, the barrier shall extend to the recommended height above the highest point between the residential home and the road. The barrier shall provide a weight of at least 4 pounds per square foot of face area with no decorative cutouts or line-of-sight openings between shielded areas and the roadways. The noise barrier shall be constructed using the following materials:

- Masonry block
- Stucco veneer over wood framing (or foam core), or 1 inch thick tongue and groove wood of sufficient weight per square foot
- Glass (1/4 inch thick), or other transparent material with sufficient weight per square foot
- Earthen berm
- Any combination of these construction materials

The barrier shall consist of a solid face from top to bottom. Unnecessary openings or decorative cutouts shall not be made. All gaps (except for weep holes) should be filled with grout or caulking.

INTERIOR NOISE MITIGATION

To satisfy the City of San Bernardino 45 dBA CNEL interior noise level criteria, lots facing the I-215 Freeway, West Little League Drive, and Magnolia Avenue will require a Noise Reduction (NR) of up to 29.3 dBA and a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning). In order to meet the City of San Bernardino 45 dBA CNEL interior noise standards the Project shall provide the following or equivalent noise mitigation measures:

- Exterior walls: If wood construction is used, exterior walls shall be furnished on the outside with siding-on-sheathing, stucco, or brick veneer. The interior surface shall be at least one-half inch gypsum board. Insulation having a minimum of R-11 shall be placed between the studs. Masonry walls, if used, shall have at least one surface of the wall plastered, painted, or covered with gypsum wallboard or approved materials. At least R-11 insulation shall be placed between the studs. There shall be no direct openings such as mail slots or ventilation units.
- Windows:
    - Lots 47 to 55 and 75 to 82 facing the I-215 Freeway require upgraded second floor windows with a minimum sound transmission class (STC) rating of 34.
    - All other windows and sliding glass doors shall be well fitted, well weather-stripped assemblies and shall have a minimum STC rating of 27.

- Doors: All exterior hinged and sliding glass doors to habitable rooms that are directly exposed to transportation noise and are facing the source of the noise shall be a door and edge seal assembly with a minimum STC rating of 27.
- Roof: Roof sheathing of wood construction shall be well fitted or caulked plywood of at least one-half inch thick. Ceilings shall be well fitted, well-sealed gypsum board of at least one-half inch thick. Insulation with at least a rating of R-19 shall be used in the attic space. Skylights shall have a minimum STC of 34.
- Attic: Attic ventilation shall be oriented away from the I-215 Freeway. If such an orientation cannot be avoided, then an acoustical baffle shall be placed in the attic space behind the vents.
- Ventilation: A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Building Code in each habitable room without opening any window, door or other opening to the exterior. All concealed ductwork shall be insulated flexible glass fiber ducting that is at least ten feet long between any two points of connection. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.
- Wall and ceiling openings: Openings in the shell of the residence which degrade its ability to achieve an interior CNEL rating of 45 dBA or less when all doors and windows are closed are prohibited unless access panels, pet doors, mail delivery drops, air- conditioning, or other openings are designed to maintain the 45 dBA CNEL (or less) standard in the room to which they provide access.

With the interior noise mitigation measures provided in this study, the proposed Rancho Palma is expected to meet the City of San Bernardino 45 dBA CNEL interior noise level standards for residential development.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the noise sources within the Rancho Palma site, this analysis estimates the Project-related 24-hour operational stationary-source noise levels at the noise-sensitive receiver locations. The Project-related noise sources are expected to include: roof-top air conditioning units, shopping cart corrals, parking lot vehicle movements, and loading dock activities.

The analysis shows that the Project-related operational noise levels will satisfy the City of San Bernardino Development Code noise level standards at the sensitive receivers nearest the Project site. Further, this analysis demonstrates that the Project will not contribute an operational noise level impact to the existing ambient noise environment at any of the sensitive receiver locations. Therefore, the operational noise level impacts associated with the proposed Project activities, such as the roof-top air conditioning units, shopping cart corrals, parking lot vehicle movements, and loading dock activities will be *less than significant*.

CONSTRUCTION NOISE ANALYSIS

Construction noise represents a short-term impact on the ambient noise levels. Based on the five phases of Project construction, the temporary construction-related noise impacts are expected to create temporary and intermittent high-level noise at receivers surrounding the Project site when certain activities occur near the property line. While the City of San Bernardino establishes limits to the hours during which construction activity may take place, it does not identify specific noise level limits for construction noise levels. Section 8.54.060(I) *Exemptions* indicates that Project construction noise levels are considered exempt from the provisions of the ordinance. Therefore, if Project construction only occurs during the permitted hours of the Noise Control Ordinance, then the construction noise levels shall be exempt from the Noise Control Ordinance.

CONSTRUCTION NOISE & VIBRATION ABATEMENT MEASURES

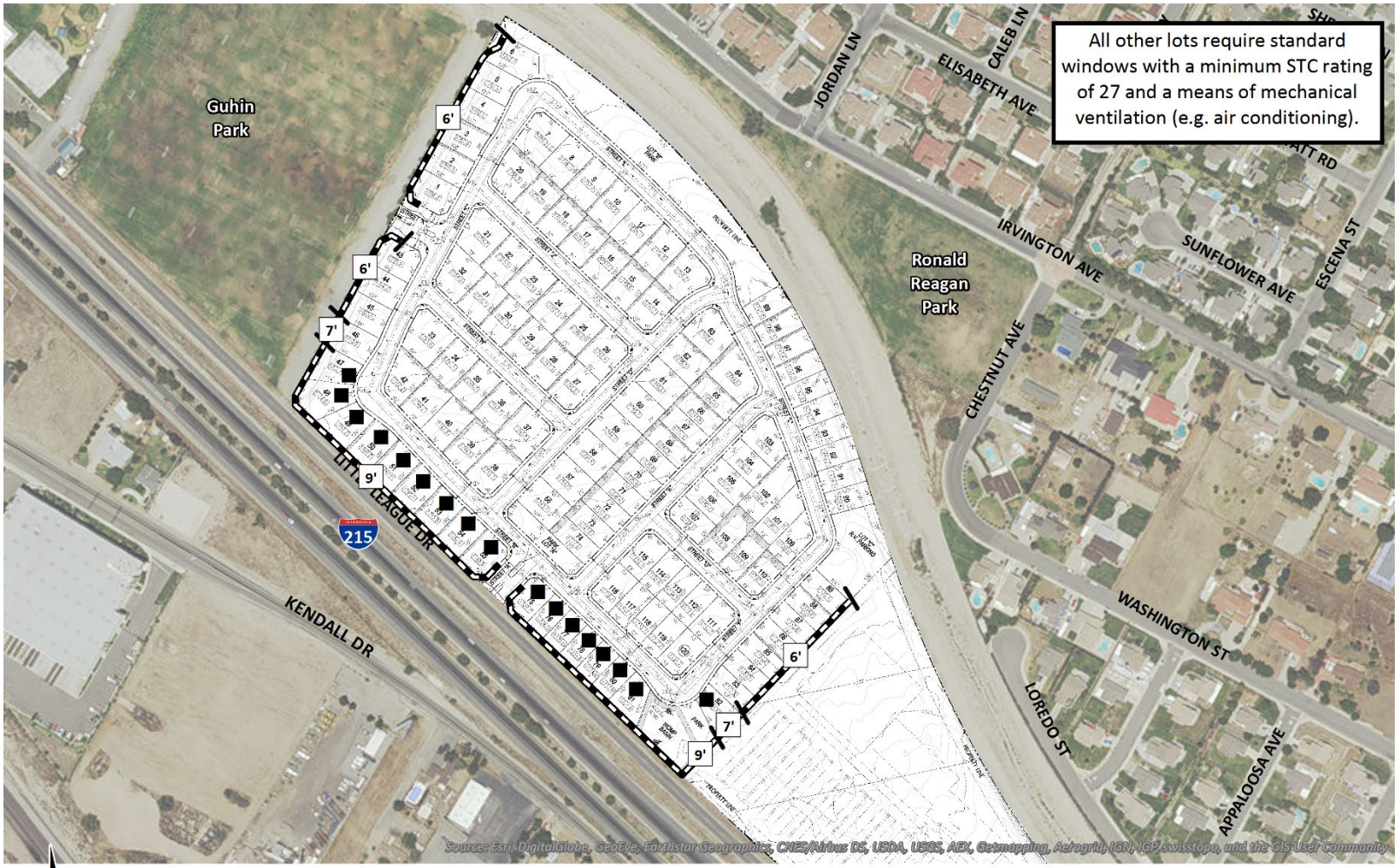
Though construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts, the following practices would reduce any noise level increases produced by the construction equipment to the nearby noise sensitive residential land uses.

- 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 only occur between the hours of 7:00 a.m. and 8:00 p.m. on any day. 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 receivers nearest the Project site (i.e., at the southern center) during all Project construction.
- The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment (between the hours of 7:00 a.m. and 8:00 p.m. on any day). The Project Applicant shall prepare a haul route exhibit to design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.

CONSTRUCTION VIBRATION ANALYSIS

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. This analysis shows the construction vibration levels are expected to approach 63.6 VdB at the eight receiver locations. Based on the FTA vibration standards of 80 VdB, the proposed Project construction activities will not include or require equipment, facilities, or activities that would result in a *barely perceptible* human response (annoyance), and therefore, impacts due to vibration are considered *less than significant.*

EXHIBIT ES-A: SUMMARY OF RECOMMENDATIONS



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LEGEND:

- 9' — Recommended Minimum Effective Noise Barrier Height (in feet)
- Recommended Noise Barrier
- Lots facing the I-215 Freeway requiring upgraded second floor windows with a minimum STC rating of 34.

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Rancho Palma ("Project"). This noise study describes the proposed Project, provides information regarding noise fundamentals, outlines 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 and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The proposed Rancho Palma Project is located northeast of West Little League Drive and northwest of Palm Avenue in the City of San Bernardino, as shown on Exhibit 1-A. The Interstate 215 (I-215) Freeway is located approximately 75 feet south of the Project site. Existing residential land uses in the Project study area are located north of the Project site on Irvington Avenue, Chestnut Avenue, and Loredo Street. The Guhin and Verdemont Parks are located west and north of the Project site, respectively. North of the Project site are the Cesar E. Chavez Middle School on Magnolia Avenue, and the Little League Baseball Western Region Headquarters on North Little League Drive. The existing commercial retail Palm Travel Center is located south of the Project site on West Little League Drive.

1.2 PROJECT DESCRIPTION

The Project is proposed to include the development of up to 120 single-family detached residential dwelling units and 98,000 square feet of commercial retail use, as shown on Exhibit 1-B. For the purposes of this analysis, potential impacts have been assessed for two development phases. The two phases and their anticipated opening years are as follows:

- Phase 1 (2018) – 120 single family detached residential dwelling units (Western Half);
- Phase 2 (2019) – 98,000 square feet of commercial retail use (Eastern Half).

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN

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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 and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Day-Night Average Noise Level (LDN) and the Community Noise Equivalent Level (CNEL), representing a composite twenty-four hour noise level is utilized. The LDN and CNEL are weighted averages of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The LDN time of day corrections include the addition of 10 decibels to dBA Leq sound levels at night between 10:00 p.m. and 7:00 a.m. The CNEL time of day corrections require the addition of 5 decibels to dBA Leq sound levels in the evening from 7:00 p.m. to 10:00 p.m., in addition to the corrections for the LDN. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. LDN and CNEL do not represent the actual sound level heard at any particular time, but rather represent the total sound exposure. The City of San Bernardino relies on the 24-hour LDN level to assess land use compatibility with transportation related noise sources, however, this analysis uses the CNEL noise level to apply the more conservative evening hour corrections to the 24-hour noise levels.

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 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

2.3.4 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 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.

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or 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)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (5)

2.7 COMMUNITY RESPONSE TO NOISE

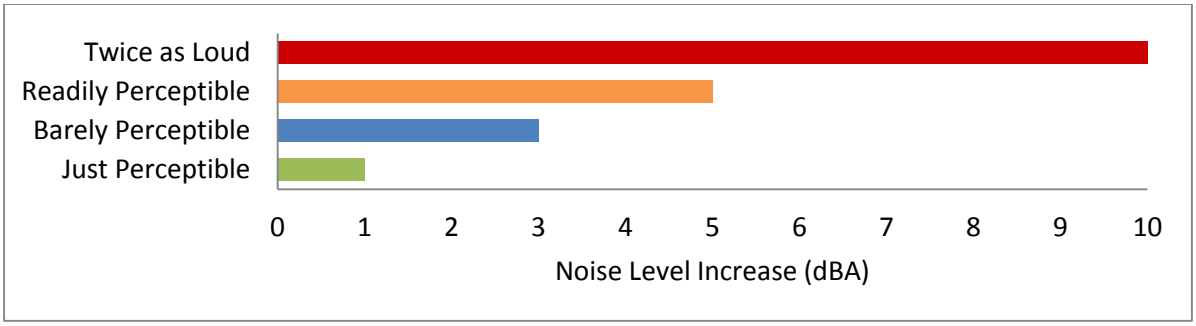
Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon each individual's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- 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 as shown on Exhibit 2-B. 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)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



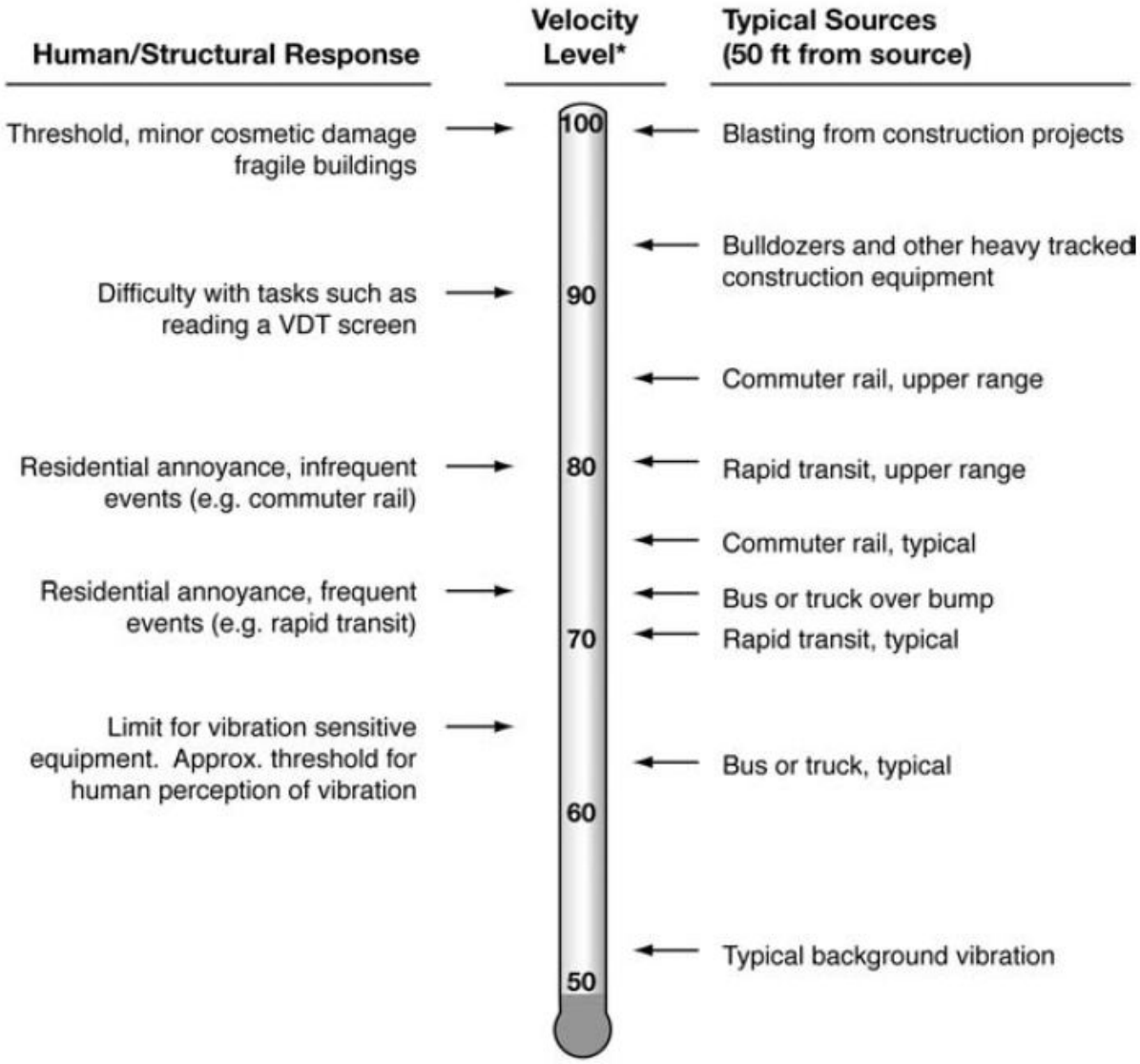
2.8 VIBRATION

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.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings, but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal, and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

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



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

Source: Federal Transit Administration (FTA) Transit Noise 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 the potential 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 CITY OF SAN BERNARDINO GENERAL PLAN NOISE ELEMENT

The City of San Bernardino General Plan Noise Element identifies several policies to minimize the impacts of excessive noise levels throughout the community. (9) The Noise Element provides policy guidance which addresses the generation, mitigation, avoidance, and the control of excessive noise. To protect City of San Bernardino residents from excessive noise levels, the Noise Element contains the following three goals:

14.1 Ensure that residents are protected from excessive noise through careful land planning.

14.2 Encourage the reduction of noise from transportation-related noise sources such as motor vehicles, aircraft operations, and railroad movements.

14.3 Protect residents from the negative effects of "spill over" or nuisance noise.

The noise policies specified in the City of San Bernardino Noise Element provide the guidelines necessary to satisfy these goals. To ensure that residents are not exposed to excessive noise levels (Goal 14.1), Policies 14.1.1 to 14.1.4 indicate that sensitive land uses such as housing, health care facilities, schools, libraries, and religious facilities should not experience exterior noise levels greater than 65 dBA LDN for exterior areas and 45 dBA LDN for interior areas. As discussed in Section 2.2 the more conservative CNEL descriptor is used in this analysis, and therefore, the exterior noise level criteria of 65 dBA CNEL and interior noise level criteria of 45 dBA CNEL shall apply to sensitive land uses. Policies 14.2.1 to 14.2.19 outline the transportation-related guidelines and mitigation strategies the City uses to satisfy Goal 14.2. To protect residents from sources of operational and construction noise (Goal 14.3), the Noise Element includes Policies 14.3.1 to 14.3.8 to adopt a Noise Ordinance and ensure noise issues between land uses are reduced. (9)

3.3.1 LAND USE COMPATIBILITY

The noise criteria identified in the City of San Bernardino Noise Element (Figure N-1) are guidelines to evaluate the land use compatibility of transportation-related noise. The compatibility criteria, shown on Exhibit 3-A, provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

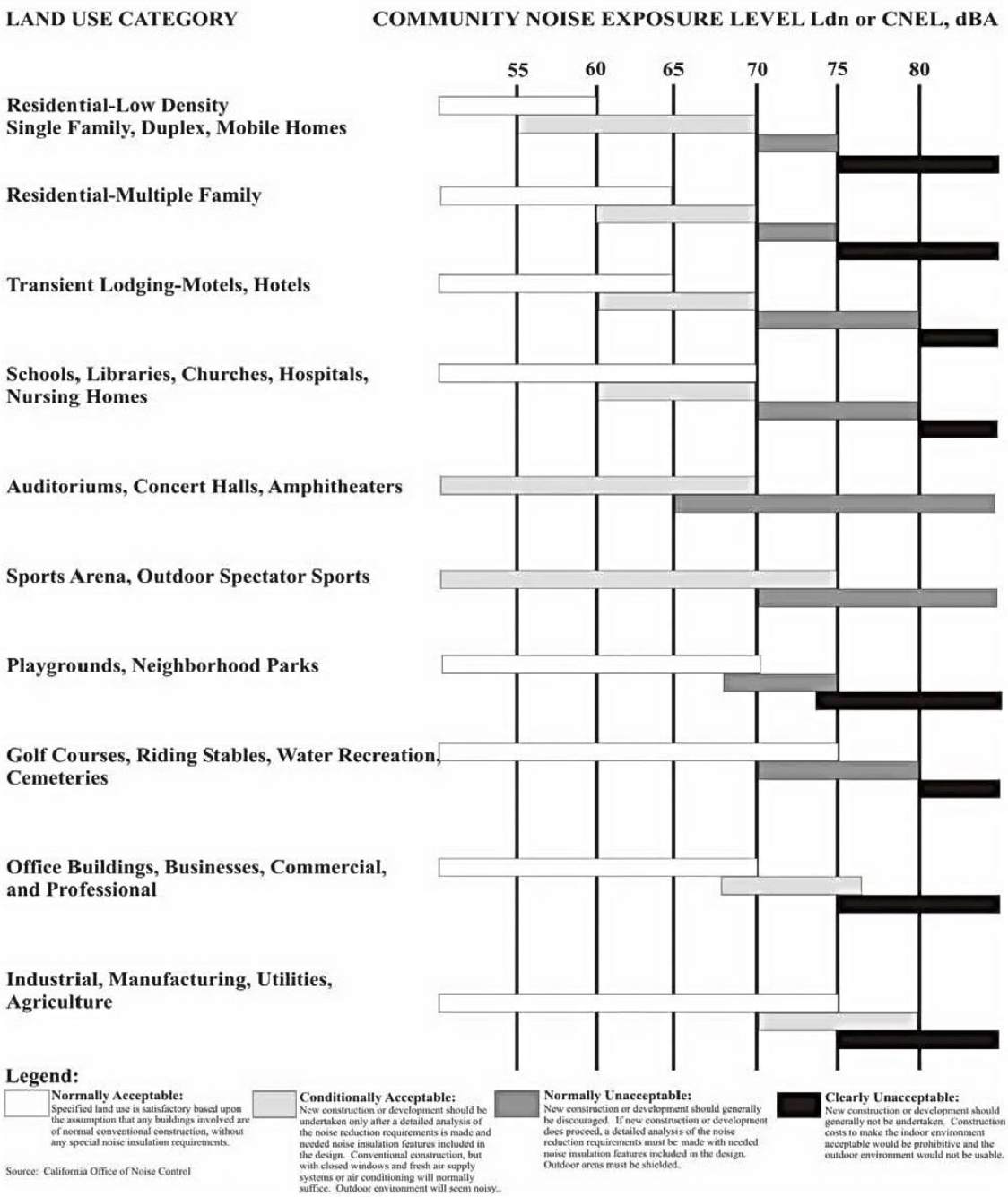
The *Land Use Compatibility for Community Noise Exposure* guidelines indicate that noise-sensitive land uses such as single-family residences are considered *normally acceptable* with exterior noise levels below 60 dBA CNEL and *conditionally acceptable* with noise levels below 70 dBA CNEL. For office and commercial land uses, exterior noise levels below 70 dBA CNEL are considered *normally acceptable* and noise levels of less than 75 are considered *conditionally acceptable*. Industrial, and manufacturing land uses are considered *normally acceptable* with noise levels below 75 dBA CNEL and conditionally acceptable with noise levels of less than 80 dBA CNEL.

3.3.2 TRANSPORTATION NOISE STANDARDS

To encourage the reduction of noise from transportation-related noise sources such as motor vehicles, aircraft operations and railroad movements (Goal 14.2), Table N-3 of the City of San

Bernardino General Plan Noise Element, shown on Exhibit 3-B, identifies a maximum allowable exterior noise level of 65 dBA CNEL and an interior noise level limit of 45 dBA CNEL for new residential developments. While the City specifically identifies an exterior noise level limit for noise-sensitive residential land uses such as hotels, hospitals, schools and parks, the City of San Bernardino does not maintain exterior noise standards for non-noise sensitive land uses such as office, retail, manufacturing, utilities, agriculture, and industrial.

EXHIBIT 3-A: LAND USE COMPATIBILITY FOR COMMUNITY NOISE EXPOSURE



Source: City of San Bernardino General Plan Noise Element, Figure N-1.

EXHIBIT 3-B: STATE OF CALIFORNIA INTERIOR AND EXTERIOR NOISE STANDARDS

Land Use		*CNEL (dBA)*	
Categories	***Uses***	***Interior [1]***	***Exterior [2]***
Residential	Single and multi-family, duplex	45[3]	65
	Mobile homes	----	65[4]
Commercial	Hotel, motel, transient housing	45	---
	Commercial retail, bank, restaurant	55	---
	Office building, research and development, professional offices	50	---
	Amphitheater, concert hall, auditorium, movie theater	45	---
	Gymnasium (Multipurpose)	50	---
	Sports Club	55	---
	Manufacturing, warehousing, wholesale, utilities	65	---
	Movie Theaters	45	---
Institutional/ Public	Hospital, school classrooms/playgrounds	45	65
	Church, library	45	---
Open Space	Parks	---	65

[1] Indoor environment excluding: bathrooms, kitchens, toilets, closets, and corridors

[2] Outdoor environment limited to:

- Private yard of single-family dwellings
- Multi-family private patios or balconies accessed from within the dwelling (Balconies 6 feet deep or less are exempt)
- Mobile home parks
- Park picnic areas
- School playgrounds
- Hospital patios

[3] Noise level requirement with closed windows, mechanical ventilation or other means of natural ventilation shall be provided as per Chapter 12, Section 1205 of the Uniform Building Code.

[4] Exterior noise levels should be such that interior noise levels will not exceed 45 dBA CNEL.

Source: City of San Bernardino General Plan Noise Element, Table N-3.

3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Rancho Palma Project, operational source noise is typically evaluated against standards established under a City's Municipal Code. While the City of San Bernardino maintains several policies in the Municipal Code Noise Control Ordinance to control the negative effects of nuisance noise, it does not identify specific exterior noise level limits. However, the policies in the Municipal Code Development Code, Chapter 19.20, *Property Development Standards* contain the exterior and interior noise level standards for residential land uses. Therefore, the stationary noise sources such as roof-top air conditioning units, shopping cart corrals, parking lot vehicle movements, and loading dock activities originating from a designated fixed location or private property such as the commercial retail use within the Rancho Palma site, are evaluated against the policies adopted in the City's Development Code. (10)

The Project operational noise impacts are governed by the City of San Bernardino Municipal Code, Section 8.54, included in Appendix 3.2. Section 8.54.060 states when: *such noises are an accompaniment and effect of a lawful business, commercial or industrial enterprise carried on in an area zoned for that purpose*…these activities shall be exempt (Section 8.54.060(B)). (11) However, due to the Project's close proximity to residential land uses, located north of the Project site boundary, Development Code, Section 19.20.030.15(A), limits the operational stationary-source noise from the Rancho Palma Project to an exterior noise level of 65 dBA for residential land use. (10) The City of San Bernardino Development Code noise standards are shown on Table 3-1 and included in Appendix 3.1.

TABLE 3-1: OPERATIONAL NOISE STANDARDS

Jurisdiction	Land Use	Exterior Noise Level Standard (dBA Leq)[1]
City of San Bernardino[1]	Residential	65

[1] Source: City of San Bernardino Development Code, Section 19.20.030.15(A) (Appendix 3.1).

3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Rancho Palma site, noise from construction activities are typically evaluated against standards established under a City's Municipal Code. The Municipal Code noise standards for construction are described below for the City of San Bernardino to determine the potential noise impacts at nearby receiver locations. The construction-related noise standards are summarized on Table 3-2.

The City of San Bernardino has set restrictions to control noise impacts associated with the construction of the proposed Project. Section 8.54.070 of the City's Noise Control Ordinance states: *No person shall be engaged or employed, or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours of 7:00 a.m. and*

8:00 p.m. (11) While the City establishes limits to the hours during which construction activity may take place, it does not identify specific noise level limits for construction noise levels. Section 8.54.060(I) *Exemptions* indicates that Project construction noise levels are considered exempt from the provisions of the ordinance. Therefore, if Project construction only occurs during the permitted hours of the Noise Control Ordinance, then the construction noise levels shall be exempt from the Noise Control Ordinance.

TABLE 3-2: CONSTRUCTION NOISE STANDARDS

Jurisdiction	Permitted Hours of Construction Activity
City of San Bernardino[1]	7:00 a.m. to 8:00 p.m. on any day.

[1] Source: City of San Bernardino Municipal Code, Section 8.54.070 (Appendix 3.2).

3.6 VIBRATION STANDARDS

The City of San Bernardino Development Code, Section 19.20.030.28 indicates: *No vibration associated with any use shall be permitted which is discernible beyond the boundary line of the property*; however, no specific vibration standards are identified. To assess vibration impacts from the Project site, this analysis uses the United States Department of Transportation Federal Transit Administration (FTA) provided guidelines for maximum-acceptable vibration criteria for different types of land uses. (12) 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. The FTA guidelines of 80 VdB for sensitive land uses provide the basis for determining the relative significance of potential Project related vibration impacts.

TABLE 3-3: CONSTRUCTION VIBRATION STANDARDS

Jurisdiction	Vibration Standard[1]	Acceptable Threshold For Analysis[2]
City of San Bernardino	No vibration associated with any use shall be permitted which is discernible beyond the boundary line of the property.	80 VdB

[1] Source: City of San Bernardino Development Code, Section 19.20.030.28 (Appendix 3.1).
[2] Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.

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 results in or causes:

A. 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;

B. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

C. A substantial permanent increase in ambient noise levels in the Project vicinity above existing levels without the proposed Project; or

D. A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above noise levels existing without the proposed Project.

E. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the Project area to excessive noise levels.

F. For a project within the vicinity of a private airstrip, expose people residing or working in the Project area to excessive noise levels.

While the CEQA Guidelines and the City of San Bernardino 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 CEQA Guideline A, they do not define the levels at which increases are considered substantial for use under Guidelines B, C, and D. CEQA Guidelines E and F do not apply to the Project since it is not located within the vicinity of a private airstrip or within two miles of a public airport.

Under CEQA Guidelines C and D, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers in order to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (13) Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. With this in mind, the Federal Interagency Committee on Noise (FICON) developed guidance to be used for the assessment of project-generated increases in noise levels that take into account the ambient noise level. (14) The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were

specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (i.e., CNEL).

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, FICON identifies a *readily perceptible* 5 dBA or greater project related noise level increase is considered a significant impact when nearby noise-sensitive receivers are affected. According to the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if noise-sensitive receivers are affected, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS

Without Project Noise Level	Potential Significant Impact
< 60 dBA	5 dBA or more
60 - 65 dBA	3 dBA or more
> 65 dBA	1.5 dBA or more

Source: Federal Interagency Committee on Noise (FICON), 1992.

Based on the significance of noise impacts outlined below on Table 4-2, noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development:

OFF-SITE TRAFFIC NOISE

- If the off-site traffic noise levels at nearby noise-sensitive land uses adjacent to roadways conveying Project traffic:
    - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
    - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase; or
    - already exceed 65 dBA CNEL, and the Project creates a community noise level impact of greater than 1.5 dBA CNEL (FICON, 1992.).

ON-SITE TRAFFIC NOISE

- If the on-site exterior noise levels exceed 65 dBA CNEL and the interior noise levels exceed 45 dBA CNEL at the residential uses located within the Project site (City of San Bernardino General Plan Noise Element, Table N-3).

OPERATIONAL NOISE

- If Project-related operational (stationary source) noise levels exceed the exterior 65 dBA Leq noise level standards at nearby sensitive residential land uses (City of San Bernardino Development Code, Section 19.20.030.15(A)); or
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
    - 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-related noise level increase; or
    - already exceed 65 dBA, and the Project creates a community noise level impact of greater than 1.5 dBA (FICON, 1992).

CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities occur anytime other than between the permitted hours of 7:00 a.m. and 8:00 p.m. on any day (City of San Bernardino Municipal Code, Section 8.54.070).
- If short-term Project generated construction source vibration levels could exceed the FTA maximum acceptable vibration standard of 80 vibration decibels (VdB) at sensitive receiver locations (FTA, Transit Noise and Vibration Impact Assessment, May 2006).

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site[1]	Noise-Sensitive	if ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		if ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
On-Site[2]	Residential	Exterior Noise Level	65 dBA CNEL	
		Interior Noise Level	45 dBA CNEL	
Operational[3]	Noise-Sensitive	Exterior Residential Land Use	65 dBA Leq	
Construction[4]	Permitted hours between 7:00 a.m. to 8:00 p.m. on any day.			
	Sensitive	Vibration Level Threshold[5]	80 VdB	n/a

[1] Source: FICON, 1992.
[2] Source: City of San Bernardino General Plan Noise Element, Table N-3.
[3] Source: City of San Bernardino Development Code, Section 19.20.030.15(A) (Appendix 3.1).
[4] Source: City of San Bernardino Municipal Code, Section 8.54.070 (Appendix 3.2).
[5] Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, four 24-hour noise level measurements were taken at sensitive receiver locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Tuesday, August 18th, 2015. 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 satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (15)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. To describe the existing noise environment, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential cumulative noise impacts.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

5.3 NOISE MEASUREMENT RESULTS

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 hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the noise levels north of the Project site adjacent to an existing barrier for residential homes and across Magnolia Avenue from Cesar E. Chavez Middle School. The noise level measurements collected show an overall 24-hour exterior noise level of 67.7 dBA CNEL. The hourly noise levels measured at location L1 ranged from 53.4 to 62.2 dBA Leq during the daytime hours and from 52.6 to 68.5 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 58.8 dBA Leq with an average nighttime noise level of 61.5 dBA Leq.
- Location L2 represents the noise levels north of the Project site on Chestnut Avenue near existing residential homes and the Ronald Reagan Park. The noise level measurements collected show an overall 24-hour exterior noise level of 60.9 dBA CNEL. The hourly noise levels measured at location L2 ranged from 48.9 to 55.9 dBA Leq during the daytime hours and from 49.2 to 59.8 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 53.0 dBA Leq with an average nighttime noise level of 54.6 dBA Leq.
- Location L3 represents the noise levels south of Guhin Park at the Project site boundary on Little League Drive north of the I-215 Freeway. The 24-hour CNEL indicates that the overall exterior noise level is 75.7 dBA CNEL. At location L3 the background ambient noise levels ranged from 67.7 to 71.8 dBA Leq during the daytime hours to levels of 64.8 to 71.6 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 69.8 dBA Leq with an average nighttime noise level of 68.9 dBA Leq.
- Located at the Project site boundary, location L4 represents the noise levels on Little League Drive north of the I-215 Freeway. The noise level measurements collected show an overall 24-hour exterior noise level of 76.3 dBA CNEL. The hourly noise levels measured at location L4 ranged from 69.3 to 71.5 dBA Leq during the daytime hours and from 65.7 to 72.0 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 70.5 dBA Leq with an average nighttime noise level of 69.4 dBA Leq.

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

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 on the I-215 Freeway near the noise level measurement locations. The 24-hour existing noise level measurements shown on Table 5-1 present the worst-case existing unmitigated ambient noise conditions.

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Distance To Project Boundary	Description	Energy Average Hourly Noise Level (dBA Leq)[2]		CNEL
			Daytime	Nighttime	
L1	386'	Located north of the Project site adjacent to an existing barrier for residential homes and across Magnolia Avenue from Cesar E. Chavez Middle School.	58.8	61.5	67.7
L2	254'	Located north of the Project site on Chestnut Avenue near existing residential homes and the Ronald Reagan Park.	53.0	54.6	60.9
L3	0'	Located south of Guhin Park at the Project site boundary on Little League Drive north of the Interstate 215 Freeway.	69.8	68.9	75.7
L4	0'	Located at the Project site boundary on Little League Drive north of the Interstate 215 Freeway.	70.5	69.4	76.3

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

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. (16) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (17) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period.

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the 32 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications according to the City of San Bernardino General Plan Circulation Element, and the posted 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, Existing plus Ambient (2018), Existing plus Ambient (2019), Opening Year Cumulative (2018), Opening Year Cumulative (2019), and Year 2035 average daily traffic volumes used for this study are presented on Tables 6-2 and 6-3 and were provided by the *Rancho Palma Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (1) Table 6-4 provides the time of day (daytime, evening and nighttime) vehicle splits.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Adjacent Land Use[1]	Distance From Centerline To Nearest Adjacent Land Use (Feet)[2]	Vehicle Speed (mph)[3]
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	44'	35
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	44'	35
3	Palm Av.	n/o Belmont Av.	Residential	44'	25
4	Palm Av.	s/o Belmont Av.	Residential	44'	45
5	Palm Av.	s/o Irvington Av.	Residential	44'	45
6	Palm Av.	n/o Kendall Dr.	Residential	44'	45
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	44'	45
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	44'	45
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	44'	45
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	44'	45
11	Pine Av.	n/o Belmont Av.	Residential	44'	45
12	Pine Av.	s/o Belmont Av.	Residential	44'	45
13	Pine Av.	n/o Kendall Dr.	Residential	44'	45
14	Campus Pkwy.	n/o Kendall Dr.	Residential	44'	45
15	University Pkwy.	n/o Kendall Dr.	Residential	50'	45
16	University Pkwy.	s/o Kendall Dr.	Residential	50'	45
17	Belmont Av.	w/o Palm Av.	Residential	30'	25
18	Belmont Av.	e/o Palm Av.	Residential	30'	25
19	Belmont Av.	w/o Pine Av.	Residential	30'	25
20	Irvington Av.	w/o Palm Av.	Residential	30'	25
21	Irvington Av.	e/o Palm Av.	Residential	30'	25
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	30'	25
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	44'	45
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	44'	45
25	W. Little League Dr.	w/o Palm Av.	Commercial	30'	45
26	Kendall Dr.	e/o Palm Av.	Commercial	50'	45
27	Kendall Dr.	w/o Pine Av.	Residential	50'	45
28	Kendall Dr.	w/o Campus Pkwy.	Residential	50'	45
29	Kendall Dr.	w/o University Pkwy.	Residential	50'	45
30	Kendall Dr.	e/o University Pkwy.	Residential	50'	45
31	I-215 Fwy.	w/o Palm Av.	Commercial	62'	70
32	I-215 Fwy.	e/o Palm Av.	Industrial	62'	70

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.

[2] Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the City of San Bernardino General Plan Circulation Element.

[3] Posted speed limits.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES (1 OF 2)

ID	Roadway	Segment	Average Daily Traffic (1,000's)[1]						
			Existing (2015)			Existing + Ambient (2018)		Existing + Ambient (2019)	
			Without Project	With Phase 1	With Buildout	Without Project	With Phase 1	Without Project	With Buildout
1	N. Little League Dr.	n/o W. Little League Dr.	1.9	1.9	2.1	2.0	2.1	2.1	2.3
2	N. Little League Dr.	s/o W. Little League Dr.	2.3	2.5	3.0	2.5	2.7	2.5	3.2
3	Palm Av.	n/o Belmont Av.	3.8	3.8	4.0	4.0	4.1	4.1	4.3
4	Palm Av.	s/o Belmont Av.	6.8	6.9	7.5	7.2	7.3	7.4	8.0
5	Palm Av.	s/o Irvington Av.	12.8	12.9	13.7	13.6	13.7	13.9	14.7
6	Palm Av.	n/o Kendall Dr.	15.4	15.4	16.3	16.3	16.4	16.6	17.6
7	Palm Av.	n/o I-215 Fwy. NB Ramps	23.2	23.9	24.8	24.7	25.3	25.1	26.8
8	Palm Av.	s/o I-215 Fwy. NB Ramps	18.0	18.3	19.0	19.1	19.4	19.5	20.5
9	Palm Av.	n/o Hallmark Pkwy.	8.9	8.9	9.3	9.4	9.5	9.6	10.1
10	Palm Av.	s/o Hallmark Pkwy.	4.9	5.0	5.2	5.3	5.3	5.4	5.6
11	Pine Av.	n/o Belmont Av.	2.7	2.7	2.9	2.9	2.9	3.0	3.2
12	Pine Av.	s/o Belmont Av.	4.1	4.1	4.7	4.3	4.3	4.4	5.0
13	Pine Av.	n/o Kendall Dr.	8.2	8.2	8.8	8.7	8.7	8.9	9.5
14	Campus Pkwy.	n/o Kendall Dr.	5.0	5.1	5.1	5.3	5.4	5.4	5.5
15	University Pkwy.	n/o Kendall Dr.	29.5	29.5	29.6	31.3	31.3	31.9	32.1
16	University Pkwy.	s/o Kendall Dr.	37.1	37.2	37.4	39.4	39.5	40.2	40.4
17	Belmont Av.	w/o Palm Av.	2.5	2.5	2.7	2.6	2.6	2.7	2.9
18	Belmont Av.	e/o Palm Av.	2.4	2.4	2.6	2.5	2.5	2.6	2.9
19	Belmont Av.	w/o Pine Av.	1.3	1.3	1.7	1.4	1.4	1.4	1.8
20	Irvington Av.	w/o Palm Av.	3.7	3.7	3.8	4.0	4.0	4.0	4.2
21	Irvington Av.	e/o Palm Av.	3.4	3.4	3.5	3.6	3.6	3.7	3.7
22	W. Little League Dr.	w/o Magnolia Av.	2.2	2.4	3.1	2.3	2.6	2.4	3.2
23	Kendall Dr.	w/o N. Little League Dr.	8.7	8.7	9.0	9.2	9.3	9.4	9.8
24	Kendall Dr.	e/o N. Little League Dr.	7.2	7.3	7.5	7.6	7.8	7.8	8.0
25	W. Little League Dr.	w/o Palm Av.	2.1	3.0	6.0	2.2	3.1	2.3	6.2
26	Kendall Dr.	e/o Palm Av.	15.6	15.8	17.0	16.6	16.8	16.9	18.2
27	Kendall Dr.	w/o Pine Av.	14.1	14.3	15.5	15.0	15.2	15.3	16.6
28	Kendall Dr.	w/o Campus Pkwy.	19.6	19.8	20.4	20.8	21.0	21.3	22.0
29	Kendall Dr.	w/o University Pkwy.	19.2	19.3	19.8	20.4	20.5	20.8	21.4
30	Kendall Dr.	e/o University Pkwy.	17.9	17.9	18.1	19.0	19.0	19.4	19.6
31	I-215 Fwy.	w/o Palm Av.	36.7	37.0	37.2	39.0	39.3	39.7	40.3
32	I-215 Fwy.	e/o Palm Av.	43.8	44.1	44.3	46.4	46.8	47.3	47.9

[1] Source: Rancho Palma Traffic Impact Analysis, September 2015.

TABLE 6-3: AVERAGE DAILY TRAFFIC VOLUMES (2 OF 2)

ID	Roadway	Segment	Average Daily Traffic (1,000's)[1]					
			Opening Year Cumulative (2018)		Opening Year Cumulative (2019)		Horizon Year (2035)	
			Without Project	With Phase 1	Without Project	With Buildout	Without Project	With Project
1	N. Little League Dr.	n/o W. Little League Dr.	2.1	2.1	2.1	2.4	2.4	2.6
2	N. Little League Dr.	s/o W. Little League Dr.	2.5	2.7	2.6	3.2	3.1	3.7
3	Palm Av.	n/o Belmont Av.	4.2	4.2	4.2	4.5	6.6	6.7
4	Palm Av.	s/o Belmont Av.	7.5	7.6	7.6	8.3	9.2	9.8
5	Palm Av.	s/o Irvington Av.	14.1	14.1	14.3	15.2	17.2	18.1
6	Palm Av.	n/o Kendall Dr.	16.8	16.9	17.1	18.1	20.6	21.7
7	Palm Av.	n/o I-215 Fwy. NB Ramps	25.9	26.6	26.4	28.0	31.5	33.2
8	Palm Av.	s/o I-215 Fwy. NB Ramps	20.7	21.1	21.1	22.1	25.1	26.1
9	Palm Av.	n/o Hallmark Pkwy.	11.4	11.5	11.6	12.1	13.6	14.0
10	Palm Av.	s/o Hallmark Pkwy.	6.0	6.1	6.1	6.4	7.1	7.4
11	Pine Av.	n/o Belmont Av.	3.1	3.1	3.2	3.4	5.3	5.4
12	Pine Av.	s/o Belmont Av.	4.8	4.8	4.9	5.5	5.4	5.9
13	Pine Av.	n/o Kendall Dr.	9.3	9.3	9.4	10.1	10.4	10.8
14	Campus Pkwy.	n/o Kendall Dr.	5.7	5.8	5.8	5.9	7.4	7.6
15	University Pkwy.	n/o Kendall Dr.	32.3	32.3	32.9	33.1	39.5	39.6
16	University Pkwy.	s/o Kendall Dr.	41.0	41.1	41.8	42.1	50.1	50.3
17	Belmont Av.	w/o Palm Av.	2.7	2.7	2.7	2.9	3.0	3.3
18	Belmont Av.	e/o Palm Av.	2.6	2.6	2.6	2.8	3.0	3.1
19	Belmont Av.	w/o Pine Av.	1.4	1.4	1.5	1.9	1.6	2.0
20	Irvington Av.	w/o Palm Av.	4.0	4.0	4.1	4.2	4.5	4.8
21	Irvington Av.	e/o Palm Av.	3.7	3.7	3.7	3.8	4.1	4.2
22	W. Little League Dr.	w/o Magnolia Av.	2.4	2.7	2.5	3.4	2.7	3.7
23	Kendall Dr.	w/o N. Little League Dr.	9.3	9.3	9.5	9.8	11.4	11.8
24	Kendall Dr.	e/o N. Little League Dr.	7.6	7.8	7.8	8.1	9.4	9.6
25	W. Little League Dr.	w/o Palm Av.	2.3	3.2	2.4	6.4	7.6	11.5
26	Kendall Dr.	e/o Palm Av.	17.8	18.0	18.1	19.5	19.9	21.1
27	Kendall Dr.	w/o Pine Av.	16.0	16.1	16.3	17.6	18.4	19.6
28	Kendall Dr.	w/o Campus Pkwy.	21.9	22.1	22.3	23.0	26.7	27.4
29	Kendall Dr.	w/o University Pkwy.	21.5	21.6	21.9	22.5	26.2	26.7
30	Kendall Dr.	e/o University Pkwy.	19.5	20.0	19.9	20.1	23.9	24.1
31	I-215 Fwy.	w/o Palm Av.	39.8	40.1	40.6	41.1	80.7	81.2
32	I-215 Fwy.	e/o Palm Av.	46.9	47.2	47.8	48.3	91.2	91.8

[1] Source: Rancho Palma Traffic Impact Analysis, September 2015.

TABLE 6-4: TIME OF DAY VEHICLE SPLITS

Time Period	Vehicle Type		
	Autos	Medium Trucks	Heavy Trucks
Daytime (7:00 a.m. - 7:00 p.m.)	77.5%	84.8%	86.5%
Evening (7:00 p.m. - 10:00 p.m.)	12.9%	4.9%	2.7%
Nighttime (10:00 p.m. - 7:00 a.m.)	9.6%	10.3%	10.8%
Total:	100.0%	100.0%	100.0%

TABLE 6-5: DISTRIBUTION OF TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

Roadway	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	97.42%	1.84%	0.74%	100.00%
I-215 Fwy.[1]	90.87%	3.73%	5.40%	100.00%

[1] Source: Caltrans Data Branch Annual Average Daily Truck Traffic on the California Highways System, 2014.

6.3 ON-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

The on-site roadway parameters including the average daily traffic (ADT) volumes used for this study are presented on Table 6-6. Based on the City of San Bernardino General Plan Circulation Element, Figure C-2, West Little League Drive and Magnolia Avenue are classified as 2-lane Collectors. To predict the future on-site noise environment at the Project site, the Year 2035 with Magnolia Avenue bridge average daily traffic volumes were obtained for the I-215 Freeway, West Little League Drive, and Magnolia Avenue from the *Rancho Palma Traffic Impact Analysis*, prepared by Urban Crossroads, Inc. (1) The traffic volumes shown on Table 6-6 reflect future long-range traffic conditions needed to assess the future on-site traffic noise environment and to identify the appropriate noise mitigation measures that address the worst-case future noise conditions. For the purposes of this analysis, soft site conditions were used to analyze the on-site traffic noise impacts for the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation.

Table 6-4 presents the time of day vehicle splits by vehicle type, and Table 6-5 presents the total traffic flow distributions (vehicle mixes) used for this analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks and heavy trucks for input into the FHWA Model based on roadway types.

To predict the future noise environment at each lot within the Project site, coordinate information was collected to identify the noise transmission path between the noise source and receiver. The coordinate information is based on the Project site plan showing the plotting of each lot in relationship to the I-215 Freeway, West Little League Drive, and Magnolia Avenue, as shown in Appendix 6.1.

TABLE 6-6: ON-SITE ROADWAY PARAMETERS

Roadway Segment	Lanes	Classification[1]	Year 2035 With Magnolia Avenue Bridge Average Daily Traffic Volume[2]	Speed Limit (mph)[3]	Site Conditions
I-215 Freeway	4	Freeway	81,160	70	Soft
W. Little League Dr. e/o Magnolia Av.	2	Collector	5,600	35	Soft
W. Little League Dr. e/o Driveway 2	2	Collector	6,400	35	Soft
Magnolia Av. n/o W. Little League Dr.	2	Collector	2,500	25	Soft
Magnolia Av. n/o Driveway 1	2	Collector	2,300	25	Soft

[1] Road classifications based upon the City of San Bernardino Circulation Element, Figure C-2, and the Rancho Palma Traffic Impact Analysis prepared by Urban Crossroads, Inc.
[2] Source: Rancho Palma Traffic Impact Analysis, September 2015.
[3] Posted speed limit on the I-215 Freeway. West Little League Drive and Magnolia Avenue speed limits estimated based on similar roadways in the Project study area.

The site plan is used to identify the relationship between the roadway centerline elevation, the pad elevation and the centerline distance to the noise barrier, and the building façade. The exterior noise level impacts at the backyard receivers were placed five feet above the pad elevation and ten feet from the proposed barrier location or at the proposed building façade, whichever is greater. All second floor receivers were located fourteen feet above the proposed finished floor elevation.

6.4 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 6-7. 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: $L_{VdB}(D) = L_{VdB}(25\ ft) - 30\log(D/25)$

TABLE 6-7: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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

Source: FTA, Transit Noise and Vibration Impact Assessment, May 2006.

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7 OFF-SITE 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 *Rancho Palma 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. Noise contours were developed for the following traffic scenarios:

- Existing Conditions:
  - Without Project: This scenario refers to the existing present-day noise conditions without the proposed Project.
  - With Phase 1 of the Project: This scenario refers to the existing present-day noise conditions with Phase 1 of the proposed Project.
  - With Project Buildout: This scenario refers to the existing present-day noise conditions with Buildout of the proposed Project.
- Existing plus Ambient (EA) Without / With Phase 1 of the Project (2018): This scenario refers to the existing present-day noise conditions, plus ambient growth, without and with Phase 1 of the proposed Project.
- Existing plus Ambient (EA) Without / With Project Buildout (2019): This scenario refers to the existing present-day noise conditions, plus ambient growth, without and with Buildout of the proposed Project.
- Opening Year Cumulative Without / With Phase 1 of the Project (2018): This scenario refers to the background noise conditions at future Year 2018 without and with Phase 1 of the proposed Project. This scenario corresponds to 2018 conditions, and includes all cumulative projects identified in the Traffic Impact Analysis.
- Opening Year Cumulative Without / With Project Buildout (2019): This scenario refers to the background noise conditions at future Year 2019 without and with Buildout of the proposed Project. This scenario corresponds to 2019 conditions, and includes all cumulative projects identified in the Traffic Impact Analysis.
- Year 2035 Without / With Project: This scenario refers to the background noise conditions at future Year 2035 without and with the proposed Project. This scenario corresponds to 2035 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 32 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 noise impacts at land uses adjacent to roadways conveying Project traffic. Based on the noise impact significance criteria described in Section 4, a significant off-site traffic noise level impact occurs if the without Project noise levels at nearby noise-sensitive receivers:

- 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-related 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, and 60 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 on area roadways, they appropriately do not reflect noise contribution from any surrounding stationary noise sources within the Project study area. Tables 7-1 to 7-13 present a summary of the unmitigated exterior traffic noise levels for the 32 study area roadway segments analyzed from the without Project to the with Project conditions in each of the six timeframes: Existing, Existing plus Ambient (2018), Existing plus Ambient (2019), Opening Year Cumulative (2018), Opening Year Cumulative (2019), and Year 2035 conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the 13 traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.0	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	58.8	RW	RW	RW
3	Palm Av.	n/o Belmont Av.	Residential	57.5	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	66.2	RW	53	114
5	Palm Av.	s/o Irvington Av.	Residential	68.9	RW	80	173
6	Palm Av.	n/o Kendall Dr.	Residential	69.7	RW	91	196
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	71.5	56	120	258
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	70.4	47	101	218
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	67.4	RW	63	136
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	64.8	RW	RW	91
11	Pine Av.	n/o Belmont Av.	Residential	62.2	RW	RW	61
12	Pine Av.	s/o Belmont Av.	Residential	64.0	RW	RW	81
13	Pine Av.	n/o Kendall Dr.	Residential	67.0	RW	60	129
14	Campus Pkwy.	n/o Kendall Dr.	Residential	64.8	RW	RW	93
15	University Pkwy.	n/o Kendall Dr.	Residential	72.6	74	160	345
16	University Pkwy.	s/o Kendall Dr.	Residential	73.6	87	187	402
17	Belmont Av.	w/o Palm Av.	Residential	57.9	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	57.8	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	55.1	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	59.6	RW	RW	RW
21	Irvington Av.	e/o Palm Av.	Residential	59.3	RW	RW	RW
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.4	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.3	RW	62	134
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.4	RW	55	118
25	W. Little League Dr.	w/o Palm Av.	Commercial	63.3	RW	RW	50
26	Kendall Dr.	e/o Palm Av.	Commercial	69.8	RW	105	226
27	Kendall Dr.	w/o Pine Av.	Residential	69.4	RW	98	211
28	Kendall Dr.	w/o Campus Pkwy.	Residential	70.8	57	122	263
29	Kendall Dr.	w/o University Pkwy.	Residential	70.7	56	120	259
30	Kendall Dr.	e/o University Pkwy.	Residential	70.4	53	115	247
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.0	286	616	1328
32	I-215 Fwy.	e/o Palm Av.	Industrial	80.7	322	693	1494

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.

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

TABLE 7-2: EXISTING WITH PHASE 1 PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.0	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.1	RW	RW	RW
3	Palm Av.	n/o Belmont Av.	Residential	57.5	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	66.2	RW	53	115
5	Palm Av.	s/o Irvington Av.	Residential	69.0	RW	81	174
6	Palm Av.	n/o Kendall Dr.	Residential	69.7	RW	91	196
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	71.6	57	122	263
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	70.5	47	102	220
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	67.4	RW	63	136
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	64.8	RW	RW	93
11	Pine Av.	n/o Belmont Av.	Residential	62.2	RW	RW	61
12	Pine Av.	s/o Belmont Av.	Residential	64.0	RW	RW	81
13	Pine Av.	n/o Kendall Dr.	Residential	67.0	RW	60	129
14	Campus Pkwy.	n/o Kendall Dr.	Residential	64.9	RW	44	94
15	University Pkwy.	n/o Kendall Dr.	Residential	72.6	74	160	345
16	University Pkwy.	s/o Kendall Dr.	Residential	73.6	87	187	403
17	Belmont Av.	w/o Palm Av.	Residential	57.9	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	57.8	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	55.1	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	59.6	RW	RW	RW
21	Irvington Av.	e/o Palm Av.	Residential	59.3	RW	RW	RW
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.8	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.3	RW	62	134
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.5	RW	55	119
25	W. Little League Dr.	w/o Palm Av.	Commercial	64.9	RW	RW	63
26	Kendall Dr.	e/o Palm Av.	Commercial	69.9	RW	106	228
27	Kendall Dr.	w/o Pine Av.	Residential	69.4	RW	99	213
28	Kendall Dr.	w/o Campus Pkwy.	Residential	70.9	57	123	264
29	Kendall Dr.	w/o University Pkwy.	Residential	70.7	56	121	260
30	Kendall Dr.	e/o University Pkwy.	Residential	70.4	53	115	247
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.0	288	620	1335
32	I-215 Fwy.	e/o Palm Av.	Industrial	80.8	323	697	1501

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: EXISTING WITH PROJECT BUILDOUT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.4	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.9	RW	RW	44
3	Palm Av.	n/o Belmont Av.	Residential	57.7	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	66.6	RW	56	121
5	Palm Av.	s/o Irvington Av.	Residential	69.2	RW	84	181
6	Palm Av.	n/o Kendall Dr.	Residential	70.0	44	95	204
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	71.8	58	125	269
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	70.6	49	105	226
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	67.5	RW	65	140
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.0	RW	44	95
11	Pine Av.	n/o Belmont Av.	Residential	62.5	RW	RW	64
12	Pine Av.	s/o Belmont Av.	Residential	64.6	RW	RW	89
13	Pine Av.	n/o Kendall Dr.	Residential	67.3	RW	63	135
14	Campus Pkwy.	n/o Kendall Dr.	Residential	64.9	RW	44	94
15	University Pkwy.	n/o Kendall Dr.	Residential	72.6	74	160	346
16	University Pkwy.	s/o Kendall Dr.	Residential	73.6	87	188	404
17	Belmont Av.	w/o Palm Av.	Residential	58.3	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	58.1	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	56.3	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	59.8	RW	RW	RW
21	Irvington Av.	e/o Palm Av.	Residential	59.4	RW	RW	RW
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	58.9	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.4	RW	64	137
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.6	RW	56	121
25	W. Little League Dr.	w/o Palm Av.	Commercial	67.9	RW	47	101
26	Kendall Dr.	e/o Palm Av.	Commercial	70.2	51	111	239
27	Kendall Dr.	w/o Pine Av.	Residential	69.8	RW	104	225
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.0	58	125	270
29	Kendall Dr.	w/o University Pkwy.	Residential	70.9	57	123	264
30	Kendall Dr.	e/o University Pkwy.	Residential	70.5	54	116	249
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.0	289	622	1340
32	I-215 Fwy.	e/o Palm Av.	Industrial	80.8	324	699	1505

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: EA 2018 WITHOUT PHASE 1 PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.2	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.1	RW	RW	RW
3	Palm Av.	n/o Belmont Av.	Residential	57.7	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	66.4	RW	55	118
5	Palm Av.	s/o Irvington Av.	Residential	69.2	RW	84	181
6	Palm Av.	n/o Kendall Dr.	Residential	70.0	44	95	204
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	71.8	58	125	269
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	70.7	49	105	226
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	67.6	RW	65	141
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.1	RW	45	96
11	Pine Av.	n/o Belmont Av.	Residential	62.5	RW	RW	64
12	Pine Av.	s/o Belmont Av.	Residential	64.2	RW	RW	84
13	Pine Av.	n/o Kendall Dr.	Residential	67.3	RW	62	134
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.1	RW	45	96
15	University Pkwy.	n/o Kendall Dr.	Residential	72.8	77	167	359
16	University Pkwy.	s/o Kendall Dr.	Residential	73.8	90	194	418
17	Belmont Av.	w/o Palm Av.	Residential	58.1	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	57.9	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	55.4	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	60.0	RW	RW	30
21	Irvington Av.	e/o Palm Av.	Residential	59.5	RW	RW	RW
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.6	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.5	RW	65	139
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.7	RW	57	122
25	W. Little League Dr.	w/o Palm Av.	Commercial	63.5	RW	RW	52
26	Kendall Dr.	e/o Palm Av.	Commercial	70.1	51	109	235
27	Kendall Dr.	w/o Pine Av.	Residential	69.6	RW	102	220
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.1	59	127	273
29	Kendall Dr.	w/o University Pkwy.	Residential	71.0	58	125	270
30	Kendall Dr.	e/o University Pkwy.	Residential	70.7	55	119	257
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.2	298	642	1383
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.0	334	721	1552

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.

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

TABLE 7-5: EA 2018 WITH PHASE 1 PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.4	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.5	RW	RW	RW
3	Palm Av.	n/o Belmont Av.	Residential	57.8	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	66.5	RW	55	119
5	Palm Av.	s/o Irvington Av.	Residential	69.2	RW	84	181
6	Palm Av.	n/o Kendall Dr.	Residential	70.0	44	95	204
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	71.9	59	127	273
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	70.7	49	106	229
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	67.6	RW	66	142
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.1	RW	45	96
11	Pine Av.	n/o Belmont Av.	Residential	62.5	RW	RW	64
12	Pine Av.	s/o Belmont Av.	Residential	64.2	RW	RW	84
13	Pine Av.	n/o Kendall Dr.	Residential	67.3	RW	62	134
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.2	RW	45	98
15	University Pkwy.	n/o Kendall Dr.	Residential	72.8	77	167	359
16	University Pkwy.	s/o Kendall Dr.	Residential	73.9	90	195	419
17	Belmont Av.	w/o Palm Av.	Residential	58.1	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	57.9	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	55.4	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	60.0	RW	RW	30
21	Irvington Av.	e/o Palm Av.	Residential	59.5	RW	RW	RW
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	58.1	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.5	RW	65	140
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.8	RW	58	125
25	W. Little League Dr.	w/o Palm Av.	Commercial	65.0	RW	30	65
26	Kendall Dr.	e/o Palm Av.	Commercial	70.1	51	110	237
27	Kendall Dr.	w/o Pine Av.	Residential	69.7	RW	103	222
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.1	59	128	275
29	Kendall Dr.	w/o University Pkwy.	Residential	71.0	58	126	271
30	Kendall Dr.	e/o University Pkwy.	Residential	70.7	55	119	257
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.3	299	645	1390
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.0	336	725	1561

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-6: EA 2019 WITHOUT PROJECT BUILDOUT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.4	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.1	RW	RW	RW
3	Palm Av.	n/o Belmont Av.	Residential	57.8	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	66.6	RW	56	120
5	Palm Av.	s/o Irvington Av.	Residential	69.3	RW	85	183
6	Palm Av.	n/o Kendall Dr.	Residential	70.1	44	96	206
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	71.9	59	126	272
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	70.8	49	107	230
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	67.7	RW	66	143
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.2	RW	45	98
11	Pine Av.	n/o Belmont Av.	Residential	62.6	RW	RW	66
12	Pine Av.	s/o Belmont Av.	Residential	64.3	RW	RW	85
13	Pine Av.	n/o Kendall Dr.	Residential	67.4	RW	63	136
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.2	RW	45	98
15	University Pkwy.	n/o Kendall Dr.	Residential	72.9	78	169	363
16	University Pkwy.	s/o Kendall Dr.	Residential	73.9	91	197	424
17	Belmont Av.	w/o Palm Av.	Residential	58.3	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	58.1	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	55.4	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	60.0	RW	RW	30
21	Irvington Av.	e/o Palm Av.	Residential	59.6	RW	RW	RW
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.8	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.6	RW	65	141
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.8	RW	58	125
25	W. Little League Dr.	w/o Palm Av.	Commercial	63.7	RW	RW	53
26	Kendall Dr.	e/o Palm Av.	Commercial	70.2	51	110	238
27	Kendall Dr.	w/o Pine Av.	Residential	69.7	RW	103	223
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.2	60	129	278
29	Kendall Dr.	w/o University Pkwy.	Residential	71.1	59	127	273
30	Kendall Dr.	e/o University Pkwy.	Residential	70.8	56	121	261
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.3	301	649	1399
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.1	339	730	1572

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-7: EA 2019 WITH PROJECT BUILDOUT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.8	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	60.2	RW	RW	46
3	Palm Av.	n/o Belmont Av.	Residential	58.0	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	66.9	RW	59	127
5	Palm Av.	s/o Irvington Av.	Residential	69.5	RW	88	190
6	Palm Av.	n/o Kendall Dr.	Residential	70.3	46	99	214
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	72.1	61	132	284
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	71.0	51	110	237
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	67.9	RW	69	148
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.3	RW	46	100
11	Pine Av.	n/o Belmont Av.	Residential	62.9	RW	RW	69
12	Pine Av.	s/o Belmont Av.	Residential	64.8	RW	RW	93
13	Pine Av.	n/o Kendall Dr.	Residential	67.6	RW	66	142
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.3	RW	46	99
15	University Pkwy.	n/o Kendall Dr.	Residential	72.9	79	169	365
16	University Pkwy.	s/o Kendall Dr.	Residential	73.9	92	197	425
17	Belmont Av.	w/o Palm Av.	Residential	58.6	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	58.6	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	56.5	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	60.2	RW	RW	31
21	Irvington Av.	e/o Palm Av.	Residential	59.6	RW	RW	RW
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	59.0	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.8	RW	67	145
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.9	RW	59	127
25	W. Little League Dr.	w/o Palm Av.	Commercial	68.0	RW	48	103
26	Kendall Dr.	e/o Palm Av.	Commercial	70.5	54	116	250
27	Kendall Dr.	w/o Pine Av.	Residential	70.1	51	109	235
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.3	61	132	284
29	Kendall Dr.	w/o University Pkwy.	Residential	71.2	60	129	279
30	Kendall Dr.	e/o University Pkwy.	Residential	70.8	57	122	263
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.4	304	656	1413
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.1	342	736	1586

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.

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

TABLE 7-8: OPENING YEAR 2018 WITHOUT PHASE 1 PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.4	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.1	RW	RW	RW
3	Palm Av.	n/o Belmont Av.	Residential	57.9	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	66.6	RW	56	121
5	Palm Av.	s/o Irvington Av.	Residential	69.4	RW	86	185
6	Palm Av.	n/o Kendall Dr.	Residential	70.1	45	96	208
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	72.0	60	129	277
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	71.0	51	111	239
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	68.4	RW	74	160
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.6	RW	49	105
11	Pine Av.	n/o Belmont Av.	Residential	62.8	RW	RW	67
12	Pine Av.	s/o Belmont Av.	Residential	64.7	RW	RW	90
13	Pine Av.	n/o Kendall Dr.	Residential	67.5	RW	65	140
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.4	RW	47	101
15	University Pkwy.	n/o Kendall Dr.	Residential	73.0	79	170	366
16	University Pkwy.	s/o Kendall Dr.	Residential	74.0	93	199	430
17	Belmont Av.	w/o Palm Av.	Residential	58.3	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	58.1	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	55.4	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	60.0	RW	RW	30
21	Irvington Av.	e/o Palm Av.	Residential	59.6	RW	RW	RW
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.8	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.5	RW	65	140
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.7	RW	57	122
25	W. Little League Dr.	w/o Palm Av.	Commercial	63.7	RW	RW	53
26	Kendall Dr.	e/o Palm Av.	Commercial	70.4	53	114	246
27	Kendall Dr.	w/o Pine Av.	Residential	69.9	RW	106	229
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.3	61	131	283
29	Kendall Dr.	w/o University Pkwy.	Residential	71.2	60	130	279
30	Kendall Dr.	e/o University Pkwy.	Residential	70.8	56	122	262
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.3	302	650	1401
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.0	337	726	1564

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-9: OPENING YEAR 2018 WITH PHASE 1 PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.4	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.5	RW	RW	RW
3	Palm Av.	n/o Belmont Av.	Residential	57.9	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	66.7	RW	57	122
5	Palm Av.	s/o Irvington Av.	Residential	69.4	RW	86	185
6	Palm Av.	n/o Kendall Dr.	Residential	70.1	45	97	209
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	72.1	61	131	282
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	71.1	52	112	242
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	68.5	RW	75	161
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.7	RW	49	106
11	Pine Av.	n/o Belmont Av.	Residential	62.8	RW	RW	67
12	Pine Av.	s/o Belmont Av.	Residential	64.7	RW	RW	90
13	Pine Av.	n/o Kendall Dr.	Residential	67.5	RW	65	140
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.5	RW	47	102
15	University Pkwy.	n/o Kendall Dr.	Residential	73.0	79	170	366
16	University Pkwy.	s/o Kendall Dr.	Residential	74.0	93	200	430
17	Belmont Av.	w/o Palm Av.	Residential	58.3	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	58.1	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	55.4	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	60.0	RW	RW	30
21	Irvington Av.	e/o Palm Av.	Residential	59.6	RW	RW	RW
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	58.3	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.5	RW	65	140
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.8	RW	58	125
25	W. Little League Dr.	w/o Palm Av.	Commercial	65.2	RW	31	66
26	Kendall Dr.	e/o Palm Av.	Commercial	70.4	53	115	248
27	Kendall Dr.	w/o Pine Av.	Residential	70.0	50	107	230
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.3	61	132	285
29	Kendall Dr.	w/o University Pkwy.	Residential	71.2	60	130	280
30	Kendall Dr.	e/o University Pkwy.	Residential	70.9	57	124	266
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.3	303	654	1408
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.1	338	729	1570

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-10: OPENING YEAR 2019 WITHOUT PROJECT BUILDOUT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.4	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.3	RW	RW	RW
3	Palm Av.	n/o Belmont Av.	Residential	57.9	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	66.7	RW	57	122
5	Palm Av.	s/o Irvington Av.	Residential	69.4	RW	87	187
6	Palm Av.	n/o Kendall Dr.	Residential	70.2	45	98	210
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	72.1	61	130	281
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	71.1	52	112	242
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	68.5	RW	75	162
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.7	RW	49	106
11	Pine Av.	n/o Belmont Av.	Residential	62.9	RW	RW	69
12	Pine Av.	s/o Belmont Av.	Residential	64.8	RW	RW	91
13	Pine Av.	n/o Kendall Dr.	Residential	67.6	RW	65	141
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.5	RW	47	102
15	University Pkwy.	n/o Kendall Dr.	Residential	73.1	80	172	371
16	University Pkwy.	s/o Kendall Dr.	Residential	74.1	94	202	435
17	Belmont Av.	w/o Palm Av.	Residential	58.3	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	58.1	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	55.7	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	60.1	RW	RW	30
21	Irvington Av.	e/o Palm Av.	Residential	59.6	RW	RW	RW
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.9	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.6	RW	66	142
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.8	RW	58	125
25	W. Little League Dr.	w/o Palm Av.	Commercial	63.9	RW	RW	55
26	Kendall Dr.	e/o Palm Av.	Commercial	70.5	54	116	249
27	Kendall Dr.	w/o Pine Av.	Residential	70.0	50	108	232
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.4	62	133	286
29	Kendall Dr.	w/o University Pkwy.	Residential	71.3	61	131	283
30	Kendall Dr.	e/o University Pkwy.	Residential	70.9	57	123	265
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.4	306	659	1420
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.1	341	735	1583

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-11: OPENING YEAR 2019 WITH PROJECT BUILDOUT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	59.0	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	60.2	RW	RW	46
3	Palm Av.	n/o Belmont Av.	Residential	58.2	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	67.1	RW	60	130
5	Palm Av.	s/o Irvington Av.	Residential	69.7	RW	90	194
6	Palm Av.	n/o Kendall Dr.	Residential	70.4	47	101	218
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	72.3	63	136	292
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	71.3	54	116	249
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	68.7	RW	78	167
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.9	RW	51	109
11	Pine Av.	n/o Belmont Av.	Residential	63.2	RW	RW	72
12	Pine Av.	s/o Belmont Av.	Residential	65.3	RW	46	99
13	Pine Av.	n/o Kendall Dr.	Residential	67.9	RW	69	148
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.6	RW	48	103
15	University Pkwy.	n/o Kendall Dr.	Residential	73.1	80	173	372
16	University Pkwy.	s/o Kendall Dr.	Residential	74.1	94	203	437
17	Belmont Av.	w/o Palm Av.	Residential	58.6	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	58.4	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	56.7	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	60.2	RW	RW	31
21	Irvington Av.	e/o Palm Av.	Residential	59.8	RW	RW	RW
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	59.3	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.8	RW	67	145
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.9	RW	59	128
25	W. Little League Dr.	w/o Palm Av.	Commercial	68.2	RW	49	105
26	Kendall Dr.	e/o Palm Av.	Commercial	70.8	56	122	262
27	Kendall Dr.	w/o Pine Av.	Residential	70.3	53	113	244
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.5	63	136	292
29	Kendall Dr.	w/o University Pkwy.	Residential	71.4	62	134	288
30	Kendall Dr.	e/o University Pkwy.	Residential	70.9	58	124	267
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.5	308	665	1432
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.2	344	740	1594

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.

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

TABLE 7-12: YEAR 2035 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	59.0	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	60.1	RW	RW	45
3	Palm Av.	n/o Belmont Av.	Residential	59.9	RW	RW	RW
4	Palm Av.	s/o Belmont Av.	Residential	67.5	RW	65	139
5	Palm Av.	s/o Irvington Av.	Residential	70.2	45	98	211
6	Palm Av.	n/o Kendall Dr.	Residential	71.0	51	111	238
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	72.8	68	147	316
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	71.9	59	126	272
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	69.2	RW	84	181
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	66.4	RW	54	117
11	Pine Av.	n/o Belmont Av.	Residential	65.1	RW	45	96
12	Pine Av.	s/o Belmont Av.	Residential	65.2	RW	45	98
13	Pine Av.	n/o Kendall Dr.	Residential	68.0	RW	70	151
14	Campus Pkwy.	n/o Kendall Dr.	Residential	66.6	RW	56	120
15	University Pkwy.	n/o Kendall Dr.	Residential	73.9	90	195	419
16	University Pkwy.	s/o Kendall Dr.	Residential	74.9	106	228	491
17	Belmont Av.	w/o Palm Av.	Residential	58.7	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	58.7	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	56.0	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	60.5	RW	RW	32
21	Irvington Av.	e/o Palm Av.	Residential	60.1	RW	RW	30
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	58.3	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	68.4	RW	74	160
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	67.6	RW	65	141
25	W. Little League Dr.	w/o Palm Av.	Commercial	68.9	RW	55	118
26	Kendall Dr.	e/o Palm Av.	Commercial	70.9	57	123	265
27	Kendall Dr.	w/o Pine Av.	Residential	70.5	54	117	252
28	Kendall Dr.	w/o Campus Pkwy.	Residential	72.1	70	150	323
29	Kendall Dr.	w/o University Pkwy.	Residential	72.1	69	148	319
30	Kendall Dr.	e/o University Pkwy.	Residential	71.7	65	139	300
31	I-215 Fwy.	w/o Palm Av.	Commercial	83.4	484	1042	2245
32	I-215 Fwy.	e/o Palm Av.	Industrial	83.9	525	1131	2436

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.

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

TABLE 7-13: YEAR 2035 WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)	Distance to Contour from Centerline (Feet)[2]		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	59.3	RW	RW	RW
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	60.9	RW	RW	50
3	Palm Av.	n/o Belmont Av.	Residential	60.0	RW	RW	44
4	Palm Av.	s/o Belmont Av.	Residential	67.8	RW	67	145
5	Palm Av.	s/o Irvington Av.	Residential	70.4	47	101	218
6	Palm Av.	n/o Kendall Dr.	Residential	71.2	53	114	246
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	73.1	71	152	327
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	72.0	60	129	279
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	69.3	RW	85	184
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	66.6	RW	56	120
11	Pine Av.	n/o Belmont Av.	Residential	65.2	RW	45	98
12	Pine Av.	s/o Belmont Av.	Residential	65.6	RW	48	103
13	Pine Av.	n/o Kendall Dr.	Residential	68.2	RW	72	155
14	Campus Pkwy.	n/o Kendall Dr.	Residential	66.7	RW	57	122
15	University Pkwy.	n/o Kendall Dr.	Residential	73.9	90	195	420
16	University Pkwy.	s/o Kendall Dr.	Residential	74.9	106	229	492
17	Belmont Av.	w/o Palm Av.	Residential	59.1	RW	RW	RW
18	Belmont Av.	e/o Palm Av.	Residential	58.9	RW	RW	RW
19	Belmont Av.	w/o Pine Av.	Residential	57.0	RW	RW	RW
20	Irvington Av.	w/o Palm Av.	Residential	60.8	RW	RW	34
21	Irvington Av.	e/o Palm Av.	Residential	60.2	RW	RW	31
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	59.6	RW	RW	RW
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	68.6	RW	76	164
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	67.7	RW	66	143
25	W. Little League Dr.	w/o Palm Av.	Commercial	70.7	33	72	155
26	Kendall Dr.	e/o Palm Av.	Commercial	71.1	59	128	276
27	Kendall Dr.	w/o Pine Av.	Residential	70.8	57	122	263
28	Kendall Dr.	w/o Campus Pkwy.	Residential	72.3	71	152	328
29	Kendall Dr.	w/o University Pkwy.	Residential	72.1	70	150	323
30	Kendall Dr.	e/o University Pkwy.	Residential	71.7	65	140	301
31	I-215 Fwy.	w/o Palm Av.	Commercial	83.4	486	1046	2254
32	I-215 Fwy.	e/o Palm Av.	Industrial	83.9	527	1136	2447

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING CONDITION PROJECT TRAFFIC NOISE LEVELS

Tables 7-14 and 7-15 show the Existing without and with Phase 1 and Project Buildout conditions, respectively.

7.2.1 WITH PHASE 1 PROJECT CONDITIONS

Table 7-14 presents a comparison of the Existing without and with Phase 1 Project conditions CNEL noise levels. Table 7-1 shows that the unmitigated exterior noise levels are expected to range from 55.1 to 80.7 dBA CNEL for Existing without Project conditions. Table 7-2 presents the Existing with Phase 1 Project conditions noise level contours that are expected to range from 55.1 to 80.8 dBA CNEL. As shown on Table 7-14 the Project is expected to generate an exterior noise level increase of up to 1.6 dBA CNEL, which is below the significance thresholds identified in Section 4 when the existing ambient conditions range from 60 to 65 dBA CNEL. Therefore, the Phase 1 Project-related off-site traffic noise level increases are considered *less than significant* for Existing conditions.

7.2.2 WITH PROJECT BUILDOUT CONDITIONS

Table 7-15 presents a comparison of the Existing without and with Project Buildout conditions CNEL noise levels. Table 7-3 presents the Existing with Project Buildout conditions noise level contours that are expected to range from 56.3 to 80.8 dBA CNEL. As shown on Table 7-15 the Project is expected to generate an exterior noise level increase of up to 4.6 dBA CNEL, which will exceed the significance thresholds identified in Section 4 when the existing ambient conditions range from 60 to 65 dBA CNEL on roadway segment 22: West Little League Drive west of Palm Avenue. However, since the land use adjacent to this roadway segment is commercial and not noise-sensitive, the Project Buildout-related noise level increase is considered *less than significant* for Existing conditions.

7.3 EXISTING PLUS AMBIENT 2018 PHASE 1 PROJECT TRAFFIC NOISE LEVELS

Table 7-16 presents a comparison of the Existing plus Ambient 2018 without and with Phase 1 Project conditions CNEL noise levels. Table 7-4 shows that the unmitigated exterior noise levels are expected to range from 55.4 to 81.0 dBA CNEL for Existing plus Ambient 2018 without Project conditions. Table 7-5 presents the Existing plus Ambient 2018 with Phase 1 Project conditions noise level contours that are expected to range from 55.4 to 81.0 dBA CNEL. As shown on Table 7-16 the Project is expected to generate an exterior noise level increase of up to 1.5 dBA CNEL, which is below the significance thresholds identified in Section 4 when the existing ambient conditions range from 60 to 65 dBA CNEL. Therefore, the Phase 1 Project-related off-site traffic noise level increases are considered *less than significant* for Existing plus Ambient 2018 conditions.

7.4 EXISTING PLUS AMBIENT 2019 PROJECT BUILDOUT TRAFFIC NOISE LEVELS

Table 7-17 presents a comparison of the Existing plus Ambient 2019 without and with Project Buildout conditions CNEL noise levels. Table 7-6 shows that the unmitigated exterior noise levels are expected to range from 55.4 to 81.1 dBA CNEL for Existing plus Ambient 2019 without Project conditions. Table 7-7 presents the Existing plus Ambient 2019 with Project Buildout conditions noise level contours that are expected to range from 56.5 to 81.1 dBA CNEL. As shown on Table 7-17 the Project is expected to generate an exterior noise level increase of up to 4.3 dBA CNEL, which will exceed the significance thresholds identified in Section 4 when the existing ambient conditions range from 60 to 65 dBA CNEL on roadway segment 22: West Little League Drive west of Palm Avenue. However, since the land use adjacent to this roadway segment is commercial and not noise-sensitive, the Project Buildout-related noise level increase is considered *less than significant* for Existing plus Ambient 2019 conditions.

7.5 OPENING YEAR CUMULATIVE 2018 PHASE 1 PROJECT TRAFFIC NOISE LEVELS

Table 7-18 presents a comparison of the Opening Year Cumulative 2018 without and with Phase 1 Project conditions CNEL noise levels. Table 7-8 shows that the unmitigated exterior noise levels are expected to range from 55.4 to 81.0 dBA CNEL for Opening Year Cumulative 2018 without Project conditions. Table 7-9 presents the Opening Year Cumulative 2018 with Phase 1 Project conditions noise level contours that are expected to range from 55.4 to 81.1 dBA CNEL. As shown on Table 7-18 the Project is expected to generate an exterior noise level increase of up to 1.5 dBA CNEL, which is below the significance thresholds identified in Section 4 when the existing ambient conditions range from 60 to 65 dBA CNEL. Therefore, the Phase 1 Project-related off-site traffic noise level increases are considered *less than significant* for Opening Year Cumulative 2018 conditions.

7.6 OPENING YEAR CUMULATIVE 2019 PROJECT BUILDOUT TRAFFIC NOISE LEVELS

Table 7-19 presents a comparison of the Opening Year Cumulative 2019 without and with Project Buildout conditions CNEL noise levels. Table 7-10 shows that the unmitigated exterior noise levels are expected to range from 55.7 to 81.1 dBA CNEL for Opening Year Cumulative 2019 without Project conditions. Table 7-11 presents the Opening Year Cumulative 2019 with Project Buildout conditions noise level contours that are expected to range from 56.7 to 81.2 dBA CNEL. As shown on Table 7-19 the Project is expected to generate an exterior noise level increase of up to 4.3 dBA CNEL, which will exceed the significance thresholds identified in Section 4 when the existing ambient conditions range from 60 to 65 dBA CNEL on roadway segment 22: West Little League Drive west of Palm Avenue. However, since the land use adjacent to this roadway segment is commercial and not noise-sensitive, the Project Buildout-related noise level increase is considered *less than significant* for Opening Year Cumulative 2019 conditions.

7.7 YEAR 2035 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-20 presents a comparison of the Year 2035 without and with Project conditions CNEL noise levels. Table 7-12 shows that the unmitigated exterior noise levels are expected to range from 56.0 to 83.9 dBA CNEL for Year 2035 without Project conditions. Table 7-13 presents the Year 2035 with Project conditions noise level contours that are expected to range from 57.0 to 83.9 dBA CNEL. As shown on Table 7-20 the Project is expected to generate an exterior noise level increase of up to 1.8 dBA CNEL, which will exceed the significance thresholds identified in Section 4 when the existing ambient conditions range from 60 to 65 dBA CNEL on roadway segment 22: West Little League Drive west of Palm Avenue. However, since the land use adjacent to this roadway segment is commercial and not noise-sensitive, the Project Buildout-related noise level increase is considered *less than significant* for Year 2035 conditions.

7.8 PROJECT TRAFFIC NOISE CONTRIBUTIONS

The off-site traffic noise analysis shows that the Project noise level contributions will be *less than significant* under with Project conditions in each of the six timeframes: Existing, Existing plus Ambient (2018), Existing plus Ambient (2019), Opening Year Cumulative (2018), Opening Year Cumulative (2019), and Year 2035 conditions. Further, the Project's incremental traffic-related noise level increases at land uses adjacent to roadways conveying Project traffic will diminish over time. This occurs as the background traffic on the study area roadway segments increases and the Project represents a smaller percentage of the overall traffic volume.

TABLE 7-14: EXISTING OFF-SITE PHASE 1 PROJECT RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)			Threshold Exceeded?[2]
				Without Project	With Project	Project Addition	
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.0	58.0	0.0	No
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	58.8	59.1	0.3	No
3	Palm Av.	n/o Belmont Av.	Residential	57.5	57.5	0.0	No
4	Palm Av.	s/o Belmont Av.	Residential	66.2	66.2	0.0	No
5	Palm Av.	s/o Irvington Av.	Residential	68.9	69.0	0.1	No
6	Palm Av.	n/o Kendall Dr.	Residential	69.7	69.7	0.0	No
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	71.5	71.6	0.1	No
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	70.4	70.5	0.1	No
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	67.4	67.4	0.0	No
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	64.8	64.8	0.0	No
11	Pine Av.	n/o Belmont Av.	Residential	62.2	62.2	0.0	No
12	Pine Av.	s/o Belmont Av.	Residential	64.0	64.0	0.0	No
13	Pine Av.	n/o Kendall Dr.	Residential	67.0	67.0	0.0	No
14	Campus Pkwy.	n/o Kendall Dr.	Residential	64.8	64.9	0.1	No
15	University Pkwy.	n/o Kendall Dr.	Residential	72.6	72.6	0.0	No
16	University Pkwy.	s/o Kendall Dr.	Residential	73.6	73.6	0.0	No
17	Belmont Av.	w/o Palm Av.	Residential	57.9	57.9	0.0	No
18	Belmont Av.	e/o Palm Av.	Residential	57.8	57.8	0.0	No
19	Belmont Av.	w/o Pine Av.	Residential	55.1	55.1	0.0	No
20	Irvington Av.	w/o Palm Av.	Residential	59.6	59.6	0.0	No
21	Irvington Av.	e/o Palm Av.	Residential	59.3	59.3	0.0	No
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.4	57.8	0.4	No
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.3	67.3	0.0	No
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.4	66.5	0.1	No
25	W. Little League Dr.	w/o Palm Av.	Commercial	63.3	64.9	1.6	No
26	Kendall Dr.	e/o Palm Av.	Commercial	69.8	69.9	0.1	No
27	Kendall Dr.	w/o Pine Av.	Residential	69.4	69.4	0.0	No
28	Kendall Dr.	w/o Campus Pkwy.	Residential	70.8	70.9	0.1	No
29	Kendall Dr.	w/o University Pkwy.	Residential	70.7	70.7	0.0	No
30	Kendall Dr.	e/o University Pkwy.	Residential	70.4	70.4	0.0	No
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.0	80.0	0.0	No
32	I-215 Fwy.	e/o Palm Av.	Industrial	80.7	80.8	0.1	No

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] Significance Criteria (Section 4).

TABLE 7-15: EXISTING OFF-SITE PROJECT BUILDOUT RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)			Threshold Exceeded?[2]
				Without Project	With Project	Project Addition	
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.0	58.4	0.4	No
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	58.8	59.9	1.1	No
3	Palm Av.	n/o Belmont Av.	Residential	57.5	57.7	0.2	No
4	Palm Av.	s/o Belmont Av.	Residential	66.2	66.6	0.4	No
5	Palm Av.	s/o Irvington Av.	Residential	68.9	69.2	0.3	No
6	Palm Av.	n/o Kendall Dr.	Residential	69.7	70.0	0.3	No
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	71.5	71.8	0.3	No
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	70.4	70.6	0.2	No
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	67.4	67.5	0.1	No
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	64.8	65.0	0.2	No
11	Pine Av.	n/o Belmont Av.	Residential	62.2	62.5	0.3	No
12	Pine Av.	s/o Belmont Av.	Residential	64.0	64.6	0.6	No
13	Pine Av.	n/o Kendall Dr.	Residential	67.0	67.3	0.3	No
14	Campus Pkwy.	n/o Kendall Dr.	Residential	64.8	64.9	0.1	No
15	University Pkwy.	n/o Kendall Dr.	Residential	72.6	72.6	0.0	No
16	University Pkwy.	s/o Kendall Dr.	Residential	73.6	73.6	0.0	No
17	Belmont Av.	w/o Palm Av.	Residential	57.9	58.3	0.4	No
18	Belmont Av.	e/o Palm Av.	Residential	57.8	58.1	0.3	No
19	Belmont Av.	w/o Pine Av.	Residential	55.1	56.3	1.2	No
20	Irvington Av.	w/o Palm Av.	Residential	59.6	59.8	0.2	No
21	Irvington Av.	e/o Palm Av.	Residential	59.3	59.4	0.1	No
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.4	58.9	1.5	No
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.3	67.4	0.1	No
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.4	66.6	0.2	No
25	W. Little League Dr.	w/o Palm Av.	Commercial	63.3	67.9	4.6	Yes
26	Kendall Dr.	e/o Palm Av.	Commercial	69.8	70.2	0.4	No
27	Kendall Dr.	w/o Pine Av.	Residential	69.4	69.8	0.4	No
28	Kendall Dr.	w/o Campus Pkwy.	Residential	70.8	71.0	0.2	No
29	Kendall Dr.	w/o University Pkwy.	Residential	70.7	70.9	0.2	No
30	Kendall Dr.	e/o University Pkwy.	Residential	70.4	70.5	0.1	No
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.0	80.0	0.0	No
32	I-215 Fwy.	e/o Palm Av.	Industrial	80.7	80.8	0.1	No

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] Significance Criteria (Section 4).

TABLE 7-16: EA 2018 PHASE 1 PROJECT RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)			Threshold Exceeded?[2]
				Without Project	With Project	Project Addition	
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.2	58.4	0.2	No
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.1	59.5	0.4	No
3	Palm Av.	n/o Belmont Av.	Residential	57.7	57.8	0.1	No
4	Palm Av.	s/o Belmont Av.	Residential	66.4	66.5	0.1	No
5	Palm Av.	s/o Irvington Av.	Residential	69.2	69.2	0.0	No
6	Palm Av.	n/o Kendall Dr.	Residential	70.0	70.0	0.0	No
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	71.8	71.9	0.1	No
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	70.7	70.7	0.0	No
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	67.6	67.6	0.0	No
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.1	65.1	0.0	No
11	Pine Av.	n/o Belmont Av.	Residential	62.5	62.5	0.0	No
12	Pine Av.	s/o Belmont Av.	Residential	64.2	64.2	0.0	No
13	Pine Av.	n/o Kendall Dr.	Residential	67.3	67.3	0.0	No
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.1	65.2	0.1	No
15	University Pkwy.	n/o Kendall Dr.	Residential	72.8	72.8	0.0	No
16	University Pkwy.	s/o Kendall Dr.	Residential	73.8	73.9	0.1	No
17	Belmont Av.	w/o Palm Av.	Residential	58.1	58.1	0.0	No
18	Belmont Av.	e/o Palm Av.	Residential	57.9	57.9	0.0	No
19	Belmont Av.	w/o Pine Av.	Residential	55.4	55.4	0.0	No
20	Irvington Av.	w/o Palm Av.	Residential	60.0	60.0	0.0	No
21	Irvington Av.	e/o Palm Av.	Residential	59.5	59.5	0.0	No
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.6	58.1	0.5	No
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.5	67.5	0.0	No
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.7	66.8	0.1	No
25	W. Little League Dr.	w/o Palm Av.	Commercial	63.5	65.0	1.5	No
26	Kendall Dr.	e/o Palm Av.	Commercial	70.1	70.1	0.0	No
27	Kendall Dr.	w/o Pine Av.	Residential	69.6	69.7	0.1	No
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.1	71.1	0.0	No
29	Kendall Dr.	w/o University Pkwy.	Residential	71.0	71.0	0.0	No
30	Kendall Dr.	e/o University Pkwy.	Residential	70.7	70.7	0.0	No
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.2	80.3	0.1	No
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.0	81.0	0.0	No

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] Significance Criteria (Section 4).

TABLE 7-17: EA 2019 PROJECT BUILDOUT RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)			Threshold Exceeded?[2]
				Without Project	With Project	Project Addition	
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.4	58.8	0.4	No
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.1	60.2	1.1	No
3	Palm Av.	n/o Belmont Av.	Residential	57.8	58.0	0.2	No
4	Palm Av.	s/o Belmont Av.	Residential	66.6	66.9	0.3	No
5	Palm Av.	s/o Irvington Av.	Residential	69.3	69.5	0.2	No
6	Palm Av.	n/o Kendall Dr.	Residential	70.1	70.3	0.2	No
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	71.9	72.1	0.2	No
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	70.8	71.0	0.2	No
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	67.7	67.9	0.2	No
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.2	65.3	0.1	No
11	Pine Av.	n/o Belmont Av.	Residential	62.6	62.9	0.3	No
12	Pine Av.	s/o Belmont Av.	Residential	64.3	64.8	0.5	No
13	Pine Av.	n/o Kendall Dr.	Residential	67.4	67.6	0.2	No
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.2	65.3	0.1	No
15	University Pkwy.	n/o Kendall Dr.	Residential	72.9	72.9	0.0	No
16	University Pkwy.	s/o Kendall Dr.	Residential	73.9	73.9	0.0	No
17	Belmont Av.	w/o Palm Av.	Residential	58.3	58.6	0.3	No
18	Belmont Av.	e/o Palm Av.	Residential	58.1	58.6	0.5	No
19	Belmont Av.	w/o Pine Av.	Residential	55.4	56.5	1.1	No
20	Irvington Av.	w/o Palm Av.	Residential	60.0	60.2	0.2	No
21	Irvington Av.	e/o Palm Av.	Residential	59.6	59.6	0.0	No
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.8	59.0	1.2	No
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.6	67.8	0.2	No
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.8	66.9	0.1	No
25	W. Little League Dr.	w/o Palm Av.	Commercial	63.7	68.0	4.3	Yes
26	Kendall Dr.	e/o Palm Av.	Commercial	70.2	70.5	0.3	No
27	Kendall Dr.	w/o Pine Av.	Residential	69.7	70.1	0.4	No
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.2	71.3	0.1	No
29	Kendall Dr.	w/o University Pkwy.	Residential	71.1	71.2	0.1	No
30	Kendall Dr.	e/o University Pkwy.	Residential	70.8	70.8	0.0	No
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.3	80.4	0.1	No
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.1	81.1	0.0	No

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] Significance Criteria (Section 4).

TABLE 7-18: OPENING YEAR 2018 PHASE 1 PROJECT RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)			Threshold Exceeded?[2]
				Without Project	With Project	Project Addition	
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.4	58.4	0.0	No
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.1	59.5	0.4	No
3	Palm Av.	n/o Belmont Av.	Residential	57.9	57.9	0.0	No
4	Palm Av.	s/o Belmont Av.	Residential	66.6	66.7	0.1	No
5	Palm Av.	s/o Irvington Av.	Residential	69.4	69.4	0.0	No
6	Palm Av.	n/o Kendall Dr.	Residential	70.1	70.1	0.0	No
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	72.0	72.1	0.1	No
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	71.0	71.1	0.1	No
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	68.4	68.5	0.1	No
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.6	65.7	0.1	No
11	Pine Av.	n/o Belmont Av.	Residential	62.8	62.8	0.0	No
12	Pine Av.	s/o Belmont Av.	Residential	64.7	64.7	0.0	No
13	Pine Av.	n/o Kendall Dr.	Residential	67.5	67.5	0.0	No
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.4	65.5	0.1	No
15	University Pkwy.	n/o Kendall Dr.	Residential	73.0	73.0	0.0	No
16	University Pkwy.	s/o Kendall Dr.	Residential	74.0	74.0	0.0	No
17	Belmont Av.	w/o Palm Av.	Residential	58.3	58.3	0.0	No
18	Belmont Av.	e/o Palm Av.	Residential	58.1	58.1	0.0	No
19	Belmont Av.	w/o Pine Av.	Residential	55.4	55.4	0.0	No
20	Irvington Av.	w/o Palm Av.	Residential	60.0	60.0	0.0	No
21	Irvington Av.	e/o Palm Av.	Residential	59.6	59.6	0.0	No
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.8	58.3	0.5	No
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.5	67.5	0.0	No
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.7	66.8	0.1	No
25	W. Little League Dr.	w/o Palm Av.	Commercial	63.7	65.2	1.5	No
26	Kendall Dr.	e/o Palm Av.	Commercial	70.4	70.4	0.0	No
27	Kendall Dr.	w/o Pine Av.	Residential	69.9	70.0	0.1	No
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.3	71.3	0.0	No
29	Kendall Dr.	w/o University Pkwy.	Residential	71.2	71.2	0.0	No
30	Kendall Dr.	e/o University Pkwy.	Residential	70.8	70.9	0.1	No
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.3	80.3	0.0	No
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.0	81.1	0.1	No

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] Significance Criteria (Section 4).

TABLE 7-19: OPENING YEAR 2019 PROJECT BUILDOUT RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)			Threshold Exceeded?[2]
				Without Project	With Project	Project Addition	
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	58.4	59.0	0.6	No
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	59.3	60.2	0.9	No
3	Palm Av.	n/o Belmont Av.	Residential	57.9	58.2	0.3	No
4	Palm Av.	s/o Belmont Av.	Residential	66.7	67.1	0.4	No
5	Palm Av.	s/o Irvington Av.	Residential	69.4	69.7	0.3	No
6	Palm Av.	n/o Kendall Dr.	Residential	70.2	70.4	0.2	No
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	72.1	72.3	0.2	No
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	71.1	71.3	0.2	No
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	68.5	68.7	0.2	No
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	65.7	65.9	0.2	No
11	Pine Av.	n/o Belmont Av.	Residential	62.9	63.2	0.3	No
12	Pine Av.	s/o Belmont Av.	Residential	64.8	65.3	0.5	No
13	Pine Av.	n/o Kendall Dr.	Residential	67.6	67.9	0.3	No
14	Campus Pkwy.	n/o Kendall Dr.	Residential	65.5	65.6	0.1	No
15	University Pkwy.	n/o Kendall Dr.	Residential	73.1	73.1	0.0	No
16	University Pkwy.	s/o Kendall Dr.	Residential	74.1	74.1	0.0	No
17	Belmont Av.	w/o Palm Av.	Residential	58.3	58.6	0.3	No
18	Belmont Av.	e/o Palm Av.	Residential	58.1	58.4	0.3	No
19	Belmont Av.	w/o Pine Av.	Residential	55.7	56.7	1.0	No
20	Irvington Av.	w/o Palm Av.	Residential	60.1	60.2	0.1	No
21	Irvington Av.	e/o Palm Av.	Residential	59.6	59.8	0.2	No
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	57.9	59.3	1.4	No
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	67.6	67.8	0.2	No
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	66.8	66.9	0.1	No
25	W. Little League Dr.	w/o Palm Av.	Commercial	63.9	68.2	4.3	Yes
26	Kendall Dr.	e/o Palm Av.	Commercial	70.5	70.8	0.3	No
27	Kendall Dr.	w/o Pine Av.	Residential	70.0	70.3	0.3	No
28	Kendall Dr.	w/o Campus Pkwy.	Residential	71.4	71.5	0.1	No
29	Kendall Dr.	w/o University Pkwy.	Residential	71.3	71.4	0.1	No
30	Kendall Dr.	e/o University Pkwy.	Residential	70.9	70.9	0.0	No
31	I-215 Fwy.	w/o Palm Av.	Commercial	80.4	80.5	0.1	No
32	I-215 Fwy.	e/o Palm Av.	Industrial	81.1	81.2	0.1	No

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] Significance Criteria (Section 4).

TABLE 7-20: YEAR 2035 PROJECT RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)			Threshold Exceeded?[2]
				Without Project	With Project	Project Addition	
1	N. Little League Dr.	n/o W. Little League Dr.	Public/Comm. Rec.	59.0	59.3	0.3	No
2	N. Little League Dr.	s/o W. Little League Dr.	Public Parks	60.1	60.9	0.8	No
3	Palm Av.	n/o Belmont Av.	Residential	59.9	60.0	0.1	No
4	Palm Av.	s/o Belmont Av.	Residential	67.5	67.8	0.3	No
5	Palm Av.	s/o Irvington Av.	Residential	70.2	70.4	0.2	No
6	Palm Av.	n/o Kendall Dr.	Residential	71.0	71.2	0.2	No
7	Palm Av.	n/o I-215 Fwy. NB Ramps	Commercial	72.8	73.1	0.3	No
8	Palm Av.	s/o I-215 Fwy. NB Ramps	Commercial	71.9	72.0	0.1	No
9	Palm Av.	n/o Hallmark Pkwy.	Commercial	69.2	69.3	0.1	No
10	Palm Av.	s/o Hallmark Pkwy.	Industrial	66.4	66.6	0.2	No
11	Pine Av.	n/o Belmont Av.	Residential	65.1	65.2	0.1	No
12	Pine Av.	s/o Belmont Av.	Residential	65.2	65.6	0.4	No
13	Pine Av.	n/o Kendall Dr.	Residential	68.0	68.2	0.2	No
14	Campus Pkwy.	n/o Kendall Dr.	Residential	66.6	66.7	0.1	No
15	University Pkwy.	n/o Kendall Dr.	Residential	73.9	73.9	0.0	No
16	University Pkwy.	s/o Kendall Dr.	Residential	74.9	74.9	0.0	No
17	Belmont Av.	w/o Palm Av.	Residential	58.7	59.1	0.4	No
18	Belmont Av.	e/o Palm Av.	Residential	58.7	58.9	0.2	No
19	Belmont Av.	w/o Pine Av.	Residential	56.0	57.0	1.0	No
20	Irvington Av.	w/o Palm Av.	Residential	60.5	60.8	0.3	No
21	Irvington Av.	e/o Palm Av.	Residential	60.1	60.2	0.1	No
22	W. Little League Dr.	w/o Magnolia Av.	Public Parks	58.3	59.6	1.3	No
23	Kendall Dr.	w/o N. Little League Dr.	Industrial	68.4	68.6	0.2	No
24	Kendall Dr.	e/o N. Little League Dr.	Industrial	67.6	67.7	0.1	No
25	W. Little League Dr.	w/o Palm Av.	Commercial	68.9	70.7	1.8	Yes
26	Kendall Dr.	e/o Palm Av.	Commercial	70.9	71.1	0.2	No
27	Kendall Dr.	w/o Pine Av.	Residential	70.5	70.8	0.3	No
28	Kendall Dr.	w/o Campus Pkwy.	Residential	72.1	72.3	0.2	No
29	Kendall Dr.	w/o University Pkwy.	Residential	72.1	72.1	0.0	No
30	Kendall Dr.	e/o University Pkwy.	Residential	71.7	71.7	0.0	No
31	I-215 Fwy.	w/o Palm Av.	Commercial	83.4	83.4	0.0	No
32	I-215 Fwy.	e/o Palm Av.	Industrial	83.9	83.9	0.0	No

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] Significance Criteria (Section 4).

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8 ON-SITE TRANSPORTATION NOISE IMPACTS

An on-site exterior noise impact analysis has been completed to determine the traffic noise exposure and to identify potential necessary noise abatement measures for the proposed Rancho Palma Project. It is expected that the primary source of noise impacts to the Project site will be traffic noise from the I-215 Freeway, West Little League Drive, and Magnolia Avenue. The Project will also experience some background traffic noise impacts from the Project's internal streets, however, due to the distance, topography and low traffic volume/speed, traffic noise from these roads will not make a significant contribution to the noise environment.

8.1 ON-SITE EXTERIOR NOISE ANALYSIS

Using the FHWA traffic noise prediction model and the parameters outlined in Tables 6-4 to 6-6, the expected future exterior noise levels for the single-family residential lots were calculated. Table 8-1 presents a summary of future exterior noise level impacts in the outdoor living areas (backyards) of lots facing the I-215 Freeway, West Little League Drive, and Magnolia Avenue. The on-site traffic noise level impacts indicate that the lots facing the I-215 Freeway, West Little League Drive, and Magnolia Avenue will experience unmitigated exterior noise levels ranging from 54.6 to 74.6 dBA CNEL. The on-site traffic noise analysis calculations are provided in Appendix 8.1.

To satisfy the City of San Bernardino 65 dBA CNEL exterior noise level standards for residential land use, the construction of a minimum effective 9-foot high noise barrier is required for the outdoor living areas (backyards) of lots 47 to 55 and 75 to 81 facing the I-215 Freeway and West Little League Drive. The planned noise barrier is expected to consist of a combination 1 foot high berm with an 8 foot high block wall. In addition, the construction of a minimum effective 7-foot high noise barrier is required for lot 82 facing West Little League Drive. Further, 6-foot high noise barriers are recommended for all other lots adjacent to Magnolia Avenue and the commercial retail land use of the Project site. With the recommended noise barriers shown on Exhibit ES-A, the mitigated future exterior noise levels will range from 48.8 to 65.0 dBA CNEL. This noise analysis shows that the recommended noise barriers will satisfy the City of San Bernardino 65 dBA CNEL exterior noise level standards. The effective noise barrier height recommendations represent the minimum wall and/or berm combination height required to satisfy the City of San Bernardino exterior noise level standards.

TABLE 8-1: EXTERIOR NOISE LEVELS (CNEL)

Lot Number	Roadway	Unmitigated Noise Level (dBA CNEL)	Mitigated Noise Level (dBA CNEL)	Combined Mitigated Noise Level (dBA CNEL)	Barrier Height (Feet)	Top Of Barrier Elevation (Feet)
50	I-215 Freeway	74.6	64.7	64.9	9.0'	1,758.0'
	W. Little League Dr. e/o Magnolia Av.	62.8	51.5		9.0'	1,758.0'
55	I-215 Freeway	74.6	64.9	65.0	9.0'	1,749.5'
	W. Little League Dr. e/o Magnolia Av.	62.9	52.0		9.0'	1,749.5'
79	I-215 Freeway	74.6	65.0	65.0	9.0'	1,742.6'
	W. Little League Dr. e/o Driveway 2	63.3	51.8		9.0'	1,743.6'
82	I-215 Freeway	70.9	64.0	64.1	7.0'	1,738.6'
	W. Little League Dr. e/o Driveway 2	54.6	47.3		7.0'	1,738.6'
3	Magnolia Av. n/o Driveway 1	55.0	49.0	49.0	6.0'	1,763.8'
44	Magnolia Av. n/o W. Little League Dr.	55.2	48.8	48.8	6.0'	1,760.7'

8.2 ON-SITE INTERIOR NOISE ANALYSIS

To ensure that the interior noise levels comply with the City of San Bernardino 45 dBA CNEL interior noise standards, future noise levels were calculated at the first and second floor building facades.

8.2.1 NOISE REDUCTION METHODOLOGY

The interior noise level is the difference between the predicted exterior noise level at the building facade and the noise reduction of the structure. Typical building construction will provide a Noise Reduction (NR) of approximately 12 dBA with "windows open" and a minimum 25 dBA noise reduction with "windows closed." However, sound leaks, cracks and openings within the window assembly can greatly diminish its effectiveness in reducing noise. Several methods are used to improve interior noise reduction, including: (1) weather-stripped solid core exterior doors; (2) upgraded dual glazed windows; (3) mechanical ventilation/air conditioning; and (4) exterior wall/roof assembles free of cut outs or openings.

8.2.2 INTERIOR NOISE LEVEL ASSESSMENT

To provide the necessary interior noise level reduction, Tables 8-2 and 8-3 indicate that residential homes facing the I-215 Freeway, West Little League Drive, and Magnolia Avenue will require a windows closed condition and a means of mechanical ventilation (e.g. air conditioning). Table 8-2 shows that the future unmitigated noise levels at the first floor building façade are expected to range from 47.5 to 66.3 dBA CNEL. The first floor interior noise level analysis shows that the City of San Bernardino 45 dBA CNEL interior noise level standards can be satisfied using standard windows with a minimum STC rating of 27. Table 8-3 shows that the future noise levels at the second floor building façade are expected to range from 53.6 to 74.3 dBA CNEL, and upgraded windows with a minimum STC rating of 34 are required to satisfy the City of San Bernardino's 45 dBA CNEL interior noise level standards. The interior noise analysis shows that with the recommended interior noise mitigation measures described in the Executive Summary the Project will satisfy the City of San Bernardino 45 dBA CNEL interior noise level standards for residential development.

TABLE 8-2: FIRST FLOOR INTERIOR NOISE IMPACTS (CNEL)

Lot Number	Noise Level at Façade[1]	Required Interior Noise Reduction[2]	Estimated Interior Noise Reduction[3]	Upgraded Windows[4]	Interior Noise Level[5]
50	65.8	20.8	25.0	No	40.8
55	66.1	21.1	25.0	No	41.1
79	66.3	21.3	25.0	No	41.3
82	64.5	19.5	25.0	No	39.5
3	47.7	2.7	27.0	No	20.7
44	47.5	2.5	28.0	No	19.5

[1] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).
[2] Noise reduction required to satisfy the 45 dBA CNEL interior noise standards.
[3] A minimum of 25 dBA noise reduction is assumed with standard building construction.
[4] Does the required interior noise reduction trigger upgraded with a minimum STC rating of greater than 27?
[5] Estimated interior noise level with minimum STC rating for all windows.

TABLE 8-3: SECOND FLOOR INTERIOR NOISE IMPACTS (CNEL)

Lot Number	Noise Level at Façade[1]	Required Interior Noise Reduction[2]	Estimated Interior Noise Reduction[3]	Upgraded Windows[4]	Interior Noise Level[5]
50	74.3	29.3	32.0	Yes	42.3
55	74.2	29.2	32.0	Yes	42.2
79	74.3	29.3	32.0	Yes	42.3
82	70.8	25.8	32.0	Yes	38.8
3	53.6	8.6	27.0	No	26.6
44	53.8	8.8	28.0	No	25.8

[1] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).
[2] Noise reduction required to satisfy the 45 dBA CNEL interior noise standards.
[3] Estimated interior noise reduction with the recommended windows.
[4] Does the required interior noise reduction trigger upgraded with a minimum STC rating of greater than 27?
[5] Estimated interior noise level with minimum STC rating for all windows.

9 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following eight receiver locations as shown on Exhibit 9-A were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include: schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Sensitive receivers in the vicinity of the Project site include the single-family residential dwellings located at receiver locations R2 to R8. Receiver location R1 represents the existing Cesar E. Chavez Middle School. The closest sensitive receiver is represented by location R5 at a distance of approximately 151 feet east of the Project site.

R1: Located approximately 878 feet north of the Project site, R1 represents the Cesar E. Chavez Middle School on Magnolia Avenue.

R2: Location R2 represents existing single-family residential homes located approximately 280 feet north of the Project site on Irvington Avenue. A 24-hour noise level measurement was taken near this location, L1, to describe the existing ambient noise environment.

R3: Location R3 represents the existing single-family residential homes located roughly 355 feet northeast of the Project Site on Irvington Avenue.

R4: Location R4 represents the existing single-family residential homes located approximately 250 feet east of the Project site on Washington Street. A 24-hour noise level measurement was taken at this location, L2, to describe the existing ambient noise environment.

R5: Location R5 represents an existing single-family residential home which is situated approximately 151 feet east of the Project site boundary at the cul-de-sac of Red Sky Avenue.

R6: At a distance of approximately 208 feet east of the Project site, location R6 represents noise-sensitive residential homes on Red Sky Avenue.

R7: At a distance of 240 feet from the Project site boundary, R7 represents single-family residential homes located on Red Sky Avenue.

R8: Location R8 represents the residential home located approximately 346 feet west of the Project site across the I-215 Freeway on Kendall Drive.

EXHIBIT 9-A: RECEIVER LOCATIONS

10 OPERATIONAL IMPACTS

This section analyzes the potential stationary-source operational noise impacts due to the Project's stationary noise sources on the sensitive receiver locations. Exhibit 10-A identifies the receiver locations and noise source locations used to assess the operational noise levels due to the operation of the Project.

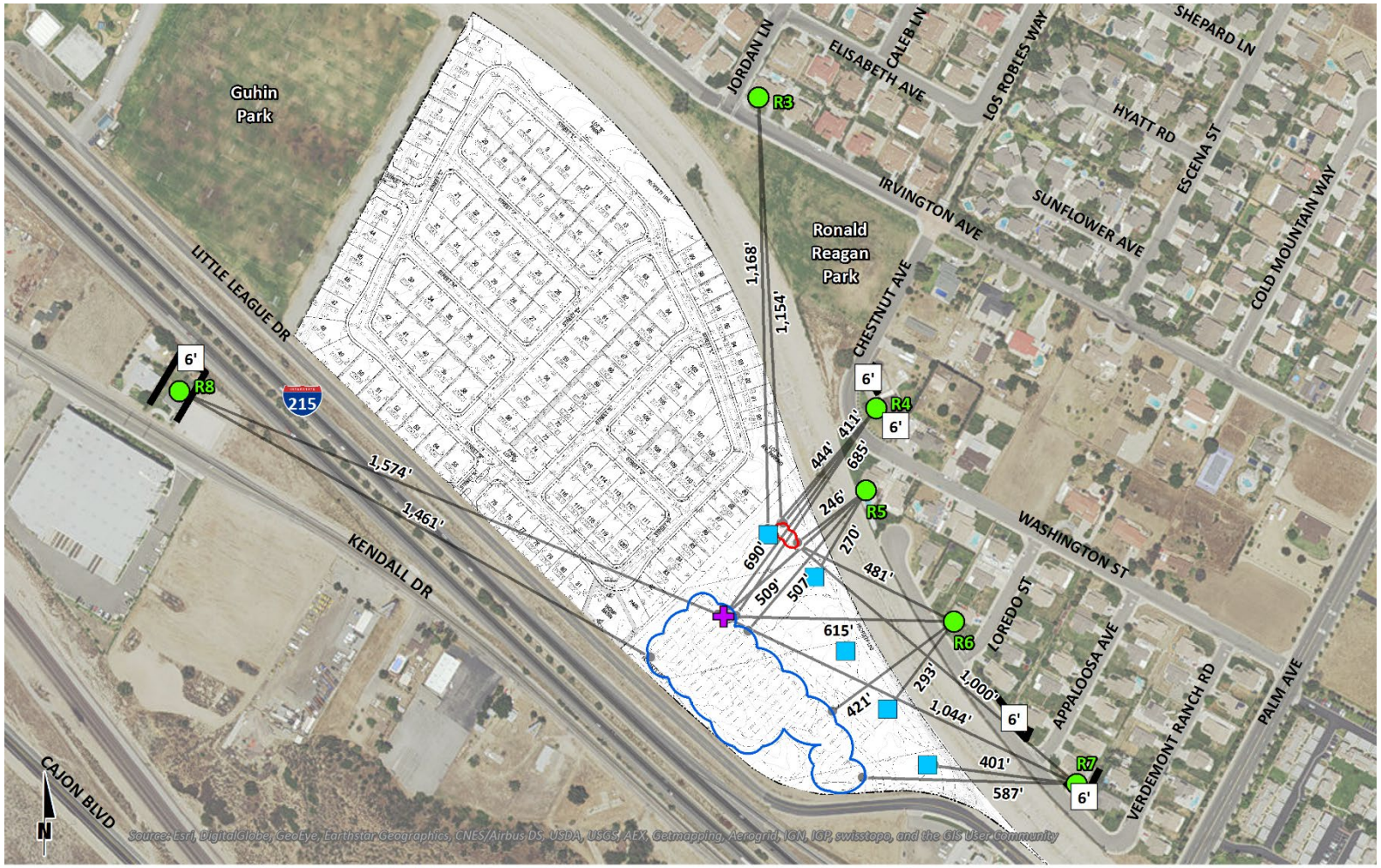
10.1 OPERATIONAL NOISE STANDARDS

The Project operational noise impacts are governed by the City of San Bernardino Municipal Code, Section 8.54, included in Appendix 3.2. Section 8.54.060 states when: *such noises are an accompaniment and effect of a lawful business, commercial or industrial enterprise carried on in an area zoned for that purpose*…these activities shall be exempt (Section 8.54.060(B)). (11) However, due to the Project's close proximity to residential land uses, located north of the Project site boundary, Development Code, Section 19.20.030.15(A), limits the operational stationary-source noise from the Rancho Palma Project to an exterior noise level of 65 dBA for residential land use. (10)

10.2 OPERATIONAL NOISE SOURCES

The potential Project-related stationary noise sources include: roof-top air conditioning units, shopping cart corrals, parking lot vehicle movements, and loading dock activities. Exhibit 10-A shows the noise source and the distance to each of the sensitive receiver locations used in this analysis.

EXHIBIT 10-A: OPERATIONAL NOISE SOURCE AND RECEIVER LOCATIONS



LEGEND:

- Receiver Locations
- Distance from receiver to center of noise source (in feet).
- 6' Existing Barrier Height (in feet)
- Existing Barrier
- Roof-Top Air Conditioning Unit
- Shopping Cart Corral
- Parking Lot Vehicle Movements
- Loading Dock Activity

10.3 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 10-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the roof-top air conditioning units, shopping cart corrals, parking lot vehicle movements, and loading dock activities all operating simultaneously. In reality, these noise level impacts will vary throughout the day.

TABLE 10-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Distance From Source (Feet)	Noise Source Height (Feet)	Hourly Activity (Minutes)[4]	Noise Level (dBA Leq)
Roof-Top Air Conditioning Unit[1]	96:00:00	5'	25'	39	77.2
Shopping Car Corrals[2]	0:16:00	5'	3'	20	72.9
Parking Lot Vehicle Movements[2]	0:15:00	5'	5'	60	60.1
Loading Dock Activities[3]	0:01:00	20'	8'	18	77.3

[1] As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.
[2] As measured by Urban Crossroads, Inc. on 5/30/2012 at the Laguna Niguel Walmart located at 27470 Alicia Parkway.
[3] As measured at the Huntington Beach Walmart by Urban Crossroads, Inc. on 4/14/2011.
[4] Anticipated duration (minutes within the hour) of noise activity during peak hourly conditions expected at the Project site.

10.3.1 ROOF-TOP AIR CONDITIONING UNITS

In order to assess the impacts created by the roof-top air conditioning units at the Project site, reference noise levels measurements were taken at an existing Walmart on July 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe a single mechanical roof-top air conditioning unit on the roof of an existing Walmart store. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At a distance of 5 feet from the roof-top air conditioning unit, the exterior noise levels were measured at 77.2 dBA Leq. Based on the typical operating conditions observed over a four-day measurement period, the roof-top air conditioning units are estimated to operate for 39 minutes during the daytime hours. These operating conditions reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. For the purpose of this noise analysis, the air conditioning units are expected to be located on the roof at a noise elevation of 25 feet.

10.3.2 SHOPPING CART CORRALS

To evaluate the noise level impacts from shopping carts placed by customers into assigned shopping cart areas, Urban Crossroads collected noise level measurements at the Laguna Niguel Walmart located at 27470 Alicia Parkway on May 30th, 2012. At a distance of 5 feet from the noise source, the noise associated with the placement of the shopping carts into the corral was measured at 72.9 dBA Leq. The noise impacts are mainly due to the metal shopping carts crashing into other carts already placed in the corral as well as striking the side rails. This noise impact analysis includes the noise level impacts associated with the adjacent shopping cart corrals with noise impacts expected for approximately 20 minutes an hour for the typical daytime and nighttime conditions.

10.3.3 PARKING LOT VEHICLE MOVEMENTS

To determine the noise level impacts associated with parking lot vehicle movements, Urban Crossroads collected reference noise level measurements at the at the Laguna Niguel Walmart located at 27470 Alicia Parkway on May 30th, 2012. The fifteen minute noise level measurement indicates that the parking lot vehicle movements generates a noise level of 60.1 dBA Leq at a distance of 5 feet. The parking lot noise levels are mainly due to cars pulling in and out of spaces, car alarms sounding, and customers moving shopping carts. Noise associated with parking lot vehicle movements is expected during the typical daytime and nighttime conditions for the entire hour (60 minutes).

10.3.4 LOADING DOCK ACTIVITY

As part of its operations, the proposed Rancho Palma Project may include truck doors and loading facilities at the northern façade of the grocery building. Loading docks will accommodate truck and vendor deliveries. Truck deliveries would consist of both semi-trucks (larger deliveries would be accomplished by way of 3+ axle tractor-trailer combinations with trailers up to 53 feet in length), and small to medium size (two-axle) trucks.

It is expected that the loading docks would be constructed to allow trailers to seal to the docks, thereby directing the unloading noise into the store, rather than onto neighboring uses. In order to evaluate the noise impacts associated with the delivery truck tractor trailer unloading/loading activities, reference noise level measurements were taken at the Huntington Beach Walmart located at the southwest corner of Goldenwest Street and Edinger Avenue by Urban Crossroads Inc. on April 14th, 2011.

The primary noise generated by tractor trailer unloading is the noise of the truck arriving, backing into the dock area, detaching the cab, attaching the cab to the empty trailer, and exiting the loading dock. Because the trailer seals to the loading dock, employees unload the tractor trailer from the inside of the store. The receiving crew places a 20' long rolling conveyor assembly inside the trailer to roll merchandise (on pallets or in boxes) into the store. The unmitigated exterior noise level was measured at 77.3 dBA Leq at a distance of 20 feet from the tractor trailer.

Delivery truck delivery activities will typically last an average of 3 to 6 minutes per truck, depending on whether or not the loading bay is empty at the time of arrival. In the event idling

does occur, idling time would be limited to no more than 5 minutes under California State law (Cal Code Regs. 2485). Delivery trucks are generally equipped with an engine shutdown system that automatically turns off the engine after 5 minutes of idling. In order to analyze a worst-case condition for noise impacts related to delivery, it is assumed that there would be a maximum of three delivery trucks coming to the loading docks and completing delivery activities within a one-hour period for both daytime and nighttime hours. For the purpose of this noise analysis, a maximum average delivery time of six minutes per delivery is used for a total of 18 minutes of activity during the peak noise hour.

10.4 OPERATIONAL NOISE LEVELS

Based upon the reference noise levels, it is possible to estimate the Project operational stationary-source noise levels at each of the sensitive receiver locations. The operational noise level calculations shown on Table 10-2 account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. With geometric spreading, sound levels attenuate (or decrease) at a rate of 6 dB for each doubling of distance from a point source (roof-top air conditioning units, shopping cart corrals, loading dock activities) and 4.5 dB for each doubling of distance from a line source (parking lot vehicle movements).

Table 10-2 indicates that the hourly noise levels associated with the roof-top air conditioning units, shopping cart corrals, parking lot vehicle movements, and loading dock activities at the commercial retail used within the Project site are expected to range from 18.6 to 50.8 dBA Leq at the sensitive receiver locations. The operational noise level calculation worksheets are included in Appendix 10.1.

TABLE 10-2: PROJECT OPERATIONAL NOISE LEVELS (DBA LEQ)

Receiver Location[1]	Noise Sources[2]	Operational Noise Levels (dBA Leq)[3]
R3	Roof-Top Air Conditioning Unit	27.9
	Shopping Cart Corral	-[4]
	Parking Lot Vehicle Movements	-[4]
	Loading Dock Activity	36.9
	Combined Noise Level:	37.4
R4	Roof-Top Air Conditioning Unit	36.3
	Shopping Cart Corral	12.8
	Parking Lot Vehicle Movements	15.6
	Loading Dock Activity	45.8
	Combined Noise Level:	46.3
R5	Roof-Top Air Conditioning Unit	40.7
	Shopping Cart Corral	15.4
	Parking Lot Vehicle Movements	16.2
	Loading Dock Activity	50.3
	Combined Noise Level:	50.8
R6	Roof-Top Air Conditioning Unit	39.9
	Shopping Cart Corral	16.6
	Parking Lot Vehicle Movements	19.3
	Loading Dock Activity	44.5
	Combined Noise Level:	45.8
R7	Roof-Top Air Conditioning Unit	32.0
	Shopping Cart Corral	13.6
	Parking Lot Vehicle Movements	18.4
	Loading Dock Activity	32.7
	Combined Noise Level:	35.5
R8	Roof-Top Air Conditioning Unit	-[4]
	Shopping Cart Corral	12.4
	Parking Lot Vehicle Movements	17.4
	Loading Dock Activity	-[4]
	Combined Noise Level:	18.6

[1] See Exhibit 9-A for the receiver and noise source locations. Receiver locations R1 and R2 do not have line of sight to the noise sources and are therefore excluded from the operational noise analysis.
[2] Reference noise sources as shown on Table 10-1.
[3] Stationary source noise level calculations are provided in Appendix 10.1.
[4] Noise source is not within the line-of-sight of the receiver location.

10.5 OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise standards, the Project-only operational noise levels are evaluated against the City of San Bernardino 65 dBA Leq exterior noise level standards, previously shown on Table 3-1. Table 10-3 shows the operational noise levels associated with the Rancho Palma commercial retail land use will not exceed the noise level standard at the sensitive residential receivers in the City of San Bernardino. Therefore, since the Project will satisfy the noise level standards of the City of San Bernardino at the nearby sensitive receiver locations, the Project-related operational noise levels will be *less than significant*.

TABLE 10-3: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Noise Level At Receiver Locations (dBA Leq)[2]	Noise Level Standard (dBA Leq)[3]	Threshold Exceeded?[4]
R1	n/a	65	No
R2	n/a	65	No
R3	37.4	65	No
R4	46.3	65	No
R5	50.8	65	No
R6	45.8	65	No
R7	35.5	65	No
R8	18.6	65	No

[1] See Exhibit 10-A for the noise receiver and noise source locations.
[2] Estimated Project stationary source noise levels as shown on Table 10-2.
[3] Noise standards as shown on Table 3-1.
[4] Do the estimated Project stationary source noise levels exceed the noise standards on the affected land uses?
"n/a" = Receiver locations R1 and R2 do not have line of sight to the noise sources and are therefore excluded from the operational noise analysis.

10.6 PROJECT OPERATIONAL NOISE CONTRIBUTION

To describe the Project operational noise level contributions, the Project operational noise levels were combined with the existing ambient noise levels measurements for the eight receiver locations potentially impacted by Project operational noise sources. The difference between the combined Project and ambient noise levels describe the Project noise level contributions. Noise levels that would be experienced at receiver locations when Project-source noise is added to the ambient daytime and nighttime conditions are presented on Tables 10-4 and 10-5, respectively.

As indicated in Table 10-4, the Project will contribute operational noise level increases approaching 2.0 dBA Leq during the daytime hours. Table 10-5 shows the Project noise level increases during the nighttime hours will approach 1.5 dBA Leq. Since the Project-related operational noise level contributions will not exceed the significance criteria discussed in Section 4, the increases at the sensitive receiver locations will be *less than significant*. On this basis, Project operational stationary-source noise would not result in a substantial temporary/periodic,

or permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project, and impacts in these regards will be *less than significant*.

TABLE 10-4: DAYTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS (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]	Threshold Exceeded?[7]
R1	n/a	L1	58.8	58.8	0.0	No
R2	n/a	L1	58.8	58.8	0.0	No
R3	37.4	L2	53.0	53.1	0.1	No
R4	46.3	L2	53.0	53.8	0.8	No
R5	50.8	L2	53.0	55.0	2.0	No
R6	45.8	L2	53.0	53.8	0.8	No
R7	35.5	L2	53.0	53.1	0.1	No
R8	18.6	L3	69.8	69.8	0.0	No

[1] See Exhibit 10-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 10-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

TABLE 10-5: NIGHTTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS (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]	Threshold Exceeded?[7]
R1	n/a	L1	61.5	61.5	0.0	No
R2	n/a	L1	61.5	61.5	0.0	No
R3	37.4	L2	54.6	54.7	0.1	No
R4	46.3	L2	54.6	55.2	0.6	No
R5	50.8	L2	54.6	56.1	1.5	No
R6	45.8	L2	54.6	55.1	0.5	No
R7	35.5	L2	54.6	54.7	0.1	No
R8	18.6	L3	68.9	68.9	0.0	No

[1] See Exhibit 10-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 10-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

11 CONSTRUCTION IMPACTS

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

11.1 CONSTRUCTION NOISE STANDARDS

The City of San Bernardino has set restrictions to control noise impacts associated with the construction of the proposed Project. Section 8.54.070 of the City's Noise Control Ordinance states: *No person shall be engaged or employed, or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours of 7:00 a.m. and 8:00 p.m.* (11) While the City establishes limits to the hours during which construction activity may take place, it does not identify specific noise level limits for construction noise levels. Section 8.54.060(I) *Exemptions* indicates that Project construction noise levels are considered exempt from the provisions of the ordinance. Therefore, if Project construction only occurs during the permitted hours of the Noise Control Ordinance, then the construction noise levels shall be exempt from the Noise Control Ordinance.

11.2 CONSTRUCTION NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers and portable generators that when combined can reach high levels. The number and mix of construction equipment is expected to occur in the following five stages:

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

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements, provided in Appendix 11.1, represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 62 dBA to in excess of 80 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 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction phases used in this analysis are consistent with the data used to support the construction emissions in the *Rancho Palma Air Quality Impact Analysis* prepared by Urban Crossroads Inc. (18)

11.3 CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 11-1 provides a summary of the sixteen construction reference noise level measurements. Since the reference noise levels were collected at varying distances, all construction noise level measurements presented on Table 11-1 have been adjusted to describe a common reference distance of 50 feet. Appendix 11.1 includes a detailed construction reference noise level memo and reference noise source photos for each type of construction activity.

TABLE 11-1: CONSTRUCTION REFERERNCE NOISE LEVELS

ID	Noise Source	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance		Reference Noise Levels @ 50 Feet[6]	
			dBA Leq	dBA Lmax	dBA Leq	dBA Lmax
1	Truck Pass-Bys & Dozer Activity[1]	30'	63.6	68.1	59.2	63.7
2	Dozer Activity[1]	30'	68.6	76.4	64.2	72.0
3	Construction Vehicle Maintenance Activities[2]	30'	71.9	74.8	67.5	70.4
4	Foundation Trenching[2]	30'	72.6	74.9	68.2	70.5
5	Rough Grading Activities[2]	30'	77.9	84.8	73.5	80.4
6	Residential Framing[3]	30'	66.7	76.7	62.3	72.3
7	Water Truck Pass-By & Backup Alarm[4]	30'	76.3	82.3	71.9	77.9
8	Dozer Pass-By[4]	30'	84.0	89.9	79.6	85.5
9	Two Scrapers & Water Truck Pass-By[4]	30'	83.4	89.0	79.0	84.6
10	Two Scrapers Pass-By[4]	30'	83.7	86.9	79.3	82.5
11	Scraper, Water Truck, & Dozer Activity[4]	30'	79.7	87.7	75.3	83.3
12	Concrete Mixer Truck Movements[5]	50'	71.2	73.1	71.2	73.1
13	Concrete Paver Activities[5]	30'	70.0	75.7	65.6	71.3
14	Concrete Mixer Pour & Paving Activities[5]	30'	70.3	76.3	65.9	71.9
15	Concrete Mixer Backup Alarms & Air Brakes[5]	50'	71.6	78.8	71.6	78.8
16	Concrete Mixer Pour Activities[5]	50'	67.7	79.2	67.7	79.2

[1] As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.
[2] As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.
[3] As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.
[4] As measured by Urban Crossroads, Inc. on 10/30/15 during grading operations within an industrial construction site located in the City of Ontario.
[5] Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.
[6] Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

11.4 CONSTRUCTION NOISE ANALYSIS

Tables 11-2 to 11-6 show the Project construction stages and the reference construction noise levels used for each stage. Table 11-7 provides a summary of the noise levels from each stage of construction at each of the sensitive receiver locations. Based on the reference construction noise levels, the Project-related construction noise levels when the peak reference noise level is operating at a single point nearest the sensitive receiver location will range from 54.7 to 70.0 dBA Leq.

TABLE 11-2: SITE PREPARATION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA Leq)
Dozer Activity	64.2
Dozer Pass-By	79.6
Peak Reference Noise Level at 50 Feet (dBA Leq) :	79.6

Receiver Location	Distance To Construction Activity (Feet)[2]	Distance Attenuation (dBA Leq)[3]	Estimated Noise Barrier Attenuation (dBA Leq)[4]	Construction Noise Level (dBA Leq)
R1	878'	-24.9	0.0	54.7
R2	280'	-15.0	0.0	64.6
R3	335'	-16.5	0.0	63.0
R4	250'	-14.0	0.0	65.6
R5	151'	-9.6	0.0	70.0
R6	208'	-12.4	0.0	67.2
R7	240'	-13.6	-5.0	60.9
R8	346'	-16.8	-5.0	57.8

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 11.1).
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers in the Project study area.

TABLE 11-3: GRADING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA Leq)
Dozer Activity	64.2
Rough Grading Activities	73.5
Dozer Pass-By	79.6
Two Scrapers Pass-By	79.3
Peak Reference Noise Level at 50 Feet (dBA Leq) :	79.6

Receiver Location	Distance To Construction Activity (Feet)[2]	Distance Attenuation (dBA Leq)[3]	Estimated Noise Barrier Attenuation (dBA Leq)[4]	Construction Noise Level (dBA Leq)
R1	878'	-24.9	0.0	54.7
R2	280'	-15.0	0.0	64.6
R3	335'	-16.5	0.0	63.0
R4	250'	-14.0	0.0	65.6
R5	151'	-9.6	0.0	70.0
R6	208'	-12.4	0.0	67.2
R7	240'	-13.6	-5.0	60.9
R8	346'	-16.8	-5.0	57.8

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 11.1).
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers in the Project study area.

TABLE 11-4: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA Leq)
Foundation Trenching	68.2
Residential Framing	62.3
Peak Reference Noise Level at 50 Feet (dBA Leq) :	68.2

Receiver Location	Distance To Construction Activity (Feet)[2]	Distance Attenuation (dBA Leq)[3]	Estimated Noise Barrier Attenuation (dBA Leq)[4]	Construction Noise Level (dBA Leq)
R1	878'	-24.9	0.0	43.3
R2	280'	-15.0	0.0	53.2
R3	335'	-16.5	0.0	51.6
R4	250'	-14.0	0.0	54.2
R5	151'	-9.6	0.0	58.6
R6	208'	-12.4	0.0	55.8
R7	240'	-13.6	-5.0	49.5
R8	346'	-16.8	-5.0	46.4

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 11.1).
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers in the Project study area.

TABLE 11-5: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA Leq)
Residential Framing	62.3
Peak Reference Noise Level at 50 Feet (dBA Leq) :	62.3

Receiver Location	Distance To Construction Activity (Feet)[2]	Distance Attenuation (dBA Leq)[3]	Estimated Noise Barrier Attenuation (dBA Leq)[4]	Construction Noise Level (dBA Leq)
R1	878'	-24.9	0.0	37.4
R2	280'	-15.0	0.0	47.3
R3	335'	-16.5	0.0	45.7
R4	250'	-14.0	0.0	48.3
R5	151'	-9.6	0.0	52.7
R6	208'	-12.4	0.0	49.9
R7	240'	-13.6	-5.0	43.6
R8	346'	-16.8	-5.0	40.5

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 11.1).
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers in the Project study area.

TABLE 11-6: PAVING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA Leq)
Concrete Mixer Truck Movements	71.2
Concrete Paver Activities	65.6
Concrete Mixer Backup Alarms & Air Brakes	71.6
Peak Reference Noise Level at 50 Feet (dBA Leq) :	71.6

Receiver Location	Distance To Construction Activity (Feet)[2]	Distance Attenuation (dBA Leq)[3]	Estimated Noise Barrier Attenuation (dBA Leq)[4]	Construction Noise Level (dBA Leq)
R1	878'	-24.9	0.0	46.7
R2	280'	-15.0	0.0	56.6
R3	335'	-16.5	0.0	55.1
R4	250'	-14.0	0.0	57.6
R5	151'	-9.6	0.0	62.0
R6	208'	-12.4	0.0	59.2
R7	240'	-13.6	-5.0	53.0
R8	346'	-16.8	-5.0	49.8

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 11.1).
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers in the Project study area.

TABLE 11-7: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Phase Hourly Noise Level (dBA Leq)					
	Site Preparation	Grading	Building Construction	Architectural Coating	Paving	Peak Activity[2]
R1	54.7	54.7	43.3	37.4	46.7	54.7
R2	64.6	64.6	53.2	47.3	56.6	64.6
R3	63.0	63.0	51.6	45.7	55.1	63.0
R4	65.6	65.6	54.2	48.3	57.6	65.6
R5	70.0	70.0	58.6	52.7	62.0	70.0
R6	67.2	67.2	55.8	49.9	59.2	67.2
R7	60.9	60.9	49.5	43.6	53.0	60.9
R8	57.8	57.8	46.4	40.5	49.8	57.8

[1] Noise receiver locations are shown on Exhibit 9-A.
[2] Estimated construction noise levels during peak operating conditions.

11.5 CONSTRUCTION NOISE ABATEMENT MEASURES

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 only occur between the hours of 7:00 a.m. and 8:00 p.m. on any day. 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 receivers nearest the Project site (i.e., at the southern center) during all Project construction.
- The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment (between the hours of 7:00 a.m. and 8:00 p.m. on any day). The Project Applicant shall prepare a haul route exhibit to design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.

11.6 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 Federal Transit Administration. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include grading. Using the vibration source level of construction equipment provided on Table 6-7 and the construction vibration assessment methodology published by the

FTA, it is possible to estimate the Project vibration impacts. Table 11-8 presents the expected Project related vibration levels at each of the sensitive receiver locations.

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 151 to 878 feet from the Project site, construction vibration levels are expected to range from 40.6 to 63.6 VdB. Using the construction vibration assessment methods provided by the FTA the proposed Project site will not include or require equipment, facilities, or activities that would result in a perceptible human response (annoyance).

The construction of the Project 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 receiver are unlikely to be sustained during the entire construction period, but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter. Therefore, the potential for the Project to result in exposure of persons to, or generation of, excessive ground-borne vibration is *less than significant*.

TABLE 11-8: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver[1]	Distance To Construction Activity (Feet)	Receiver Vibration Levels (VdB)[2]					Threshold Exceeded?[3]
		Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Peak Vibration	
R1	878'	11.6	32.6	39.6	40.6	40.6	No
R2	280'	26.5	47.5	54.5	55.5	55.5	No
R3	335'	24.2	45.2	52.2	53.2	53.2	No
R4	250'	28.0	49.0	56.0	57.0	57.0	No
R5	151'	34.6	55.6	62.6	63.6	63.6	No
R6	208'	30.4	51.4	58.4	59.4	59.4	No
R7	240'	28.5	49.5	56.5	57.5	57.5	No
R8	346'	23.8	44.8	51.8	52.8	52.8	No

[1] Receiver locations are shown on Exhibit 9-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-7.
[3] Does the peak vibration exceed the FTA maximum acceptable vibration standard of 80 (VdB)?

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12 REFERENCES

1. **Urban Crossroads, Inc.** *Rancho Palma Traffic Impact Analysis.* September 2015.
2. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
3. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
4. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* June, 1995.
5. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
6. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
7. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* May 2006. FTA-VA-90-1003-06.
8. **Office of Planning and Research.** *State of California General Plan Guidlines 2003.* October 2003.
9. **City of San Bernardino.** *General Plan, Noise Element.* November 2005.
10. —. *Municipal Code, Title 19, Article III, Chapter 19.20 - Property Development Standards.*
11. —. *Municipal Code, Title 8, Section 8.54 - Noise Control.*
12. **U.S. Department of Transportation, Federal Transit Administration.** *Transit noise and Vibration Impact Assessment.* May 2006. FTA-VA-90-1003-06.
13. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
14. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
15. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
16. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
17. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.
18. **Urban Crossroads, Inc.** *Rancho Palma Air Quality Impact Analysis.* November 2015.

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13 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Rancho Palma 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.

Bill Lawson, P.E., INCE
Principal
URBAN CROSSROADS, INC.
41 Corporate Park, Suite 300
Irvine, CA 92606
(949) 660-1994 x203
blawson@urbanxroads.com

EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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

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APPENDIX 3.1:

CITY OF SAN BERNARDINO DEVELOPMENT CODE

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ARTICLE III - GENERAL

CHAPTER 19.20
PROPERTY DEVELOPMENT STANDARDS

19.20.010 PURPOSE

These standards shall ensure that new or modified uses and development will produce an urban environment of stable, desirable character which is harmonious with the existing and future development, consistent with the General Plan.

19.20.020 APPLICABILITY

Any permit which authorizes new construction or modifications to an existing structure in excess of 25% of the structure floor area shall be subject to the standards set forth in this Chapter.

19.20.030 GENERAL STANDARDS

No permit shall be approved unless it conforms to all of the following standards set forth in this Chapter:

1. Access
2. Additional Height Restrictions
3. Antennae, Satellite Dish and Telecommunications Facilities
4. Design Considerations
5. Dust and Dirt
6. Environmental Resources/Constraints
7. Exterior Building Walls
8. Fences and Walls
9. Fire Protection
10. Fumes, Vapor and Gases
11. Glare
12. Hazardous Materials
13. Height Determination (Buildings and Structures)
14. Lighting
15. Noise
16. Odor
17. Projections into Setbacks
18. Public Street Improvements
19. Radioactivity
20. Refuse Storage/Disposal
21. Screening
22. Signs, Off-Street Parking, Off-Street Loading, and Landscaping
23. Solar Energy
24. Storage
25. Toxic Substances
26. Transportation Control Measures (TCM)
27. Underground Utilities
28. Vibration

MC 890 1/20/94, MC 1056 10/8/99

15. NOISE

No loudspeaker, bells, gongs, buzzers, mechanical equipment or other sounds, attention-attracting, or communication device associated with any use shall be discernible beyond any boundary line of the parcel, except fire protection devices, burglar alarms and church bells. The following provisions shall apply:

A. In residential areas, no exterior noise level shall exceed 65dBA and no interior noise level shall exceed 45dBA.

B. All residential developments shall incorporate the following standards to mitigate noise levels:

1. Increase the distance between the noise source and receiver.

2. Locate land uses not sensitive to noise (i.e., parking lots, garages, maintenance facilities, utility areas, etc.) between the noise source and the receiver.

3. Bedrooms should be located on the side of the structure away from major rights-of-way.

4. Quiet outdoor spaces may be provided next to a noisy right-of-way by creating a U-shaped development which faces away from the right-of-way.

C. The minimum acceptable surface weight for a noise barrier is four pounds per square foot (equivalent to ¾-inch plywood). The barrier shall be of a continuous material which is resistant to sound including:

1. Masonry block
2. Precast concrete
3. Earth berm or a combination of earth berm with block concrete.

D. Noise barriers shall interrupt the line-of-sight between noise source and receiver.

16. ODOR

No use shall emit any obnoxious odor or fumes.

17. PROJECTIONS/CONSTRUCTION AND EQUIPMENT PERMITTED INTO SETBACKS

The following list represents the only projections, construction, or equipment that shall be permitted within the required setbacks:

A. Front Setback: Roof overhangs, fireplace chimney, awnings & canopies

APPENDIX 3.2:

CITY OF SAN BERNARDINO MUNICIPAL CODE

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any stationary engine driven by means of internal combustion of gases therein, within the City of San Bernardino without placing upon the exhaust thereof a muffler or other device so as to silence the noise or report caused by the escaping of such gases from and through such exhaust. (Ord. 465 §1, 9-5-11.)

8.51.020 Violation - Penalty.

Any person, firm or corporation violating any provision of this chapter is guilty of an infraction, which upon conviction thereof is punishable in accordance with the provisions of §1.12.010 of this Code. (Ord. MC-460, 5-13-85; Ord. 465 §2, 9-5-11.)

Chapter 8.54
NOISE CONTROL

Sections:

8.54.010 Purpose and Intent.

A. It is the purpose and intent of these regulations to establish community-wide noise standards. It is further the purpose of these regulations to recognize that the existence of excessive noise within the City is a condition which is detrimental to the health, safety, welfare, and quality of life of the citizens and shall be regulated in the public interest.

B. In furtherance of the foregoing purpose, it is found and declared as follows:

1. The making, creation, or maintenance of such loud, unnecessary, unnatural, or unusual noises that are prolonged, unusual, annoying, disturbing and unnatural in their time, place, and use are a detriment to public health, comfort, convenience, safety, general welfare, and the peace and quiet of the City and its inhabitants; and

2. The public interest and necessity of 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, comfort, convenience, safety, general welfare and property, and the peace and quiet of the City and its inhabitants.

(Ord. MC-1246, 5-21-07; Ord. 1925 §1, 11-5-51.)

8.54.020 Prohibited Acts.

It shall be unlawful for any person to engage in the following activities:

A. Sounding any horn or signal device on any automobile, motorcycle, bus, or other motor vehicle in any other manner or circumstances or for any other purpose than required or permitted by the California Vehicle Code, or other laws, for an unnecessary or unreasonable period of time;

B. Racing the engine of any motor vehicle while the vehicle is not in motion, except when necessary to do so in the course of repairing, adjusting, or testing the same.

C. Operating or permitting the use of any motor vehicle on any public right-of-way or public place or on private property within a residential zone for which the exhaust muffler, intake muffler, or any other noise abatement device has been modified or changed in a manner such that the noise emitted by the motor vehicle is increased above that emitted by the vehicle as originally manufactured.

D. Using, operating, or permitting to be played, used or operated any radio receiving set, musical instrument, phonograph, or other sound amplification or production equipment for producing or reproducing sound in such a manner as to disturb the peace, quiet, or comfort of neighboring persons, or at any time with louder volume than is necessary for the convenient hearing of the person or persons who are in the room, vehicle, or other enclosure in which such machine or device is operated, and who are voluntary listeners thereto and that is:

1. Plainly audible across property boundaries;

2. Plainly audible through partitions common to two residences within a building;

3. Plainly audible at a distance of 50 feet in any direction from the source of the music or sound between the hours of 8:00 a.m. and 10:00 p.m.; or

4. Plainly audible at a distance of 25 feet in any direction from the source of the music or sound between the hours of 10:00 p.m. and 8:00 a.m.

E. The intentional sounding or permitting the sounding outdoors of any fire, burglar, or civil defense alarm, siren, whistle, or any motor vehicle burglar alarm, except for emergency purposes or for testing, unless such alarm is terminated within fifteen minutes of activation.

F. Yelling, shouting, whistling, or singing in a loud and boisterous manner on the public streets so as to disturb the quiet, comfort, or repose of persons in any office, dwelling, hotel, or other type of residence, or neighborhood.

G. The keeping of any animal, fowl, or bird which by causing frequent or long continued noise disturbs the comfort, quiet, or repose of any person or neighborhood.

H. The unnecessary or excessive blowing of whistles, sounding of horns, ringing of bells, or use of signaling devices by operators of trains, motor trucks, and other transportation equipment.

I. The creation of loud and excessive noise in connection with the loading or unloading of motor trucks and other vehicles.

J. The shouting and crying of peddlers, hawkers, and vendors which disturbs the peace and quiet of any considerable number of persons or neighborhood.

K. The doing of automobile, automotive body or fender repair work, or other work on metal objects and metal parts in a residential district so as to cause loud and excessive noise which disturbs the peace, quiet, and repose of any person occupying adjoining or closely situated property or neighborhood.

L. The operation or use between the hours of 10:00 p.m. and 8:00 a.m. of any pile driver, steam shovel, pneumatic hammers, derrick, steam or electric hoist, power driven saw, or any other tool or apparatus, the use of which is attended by loud and excessive noise, except with the approval of the City.

M. Creating excessive noise adjacent to any school, church, court, or library while the same is in use, or adjacent to any hospital or care facility, which unreasonably interferes with the workings of such institution, or which disturbs or unduly annoys patients in the hospital, provided conspicuous signs are displayed in such streets indicating the presence of a school, institution of learning, church, court, or hospital.

N. Making or knowingly and unreasonably permitting to be made any unreasonably loud, unnecessary, or unusual noise that disturbs the comfort, repose, health, peace and quiet, or which causes discomfort or annoyance to any reasonable person of normal sensitivity. The characteristics and conditions that may be considered in determining whether this section has been violated include, but are not limited to, the following:

1. The level of noise;

2. The level of background noise;

3. The proximity of the noise to sleeping facilities;

4. The nature and zoning of the areas within which the noise emanates;

5. The density of the inhabitation of the area within which the noise emanates;

6. The time of day or night the noise occurs;

7. The duration of the noise;

8. Whether the noise is recurrent, intermittent, or constant; and

9. Whether the noise is produced by a commercial or noncommercial activity.

(Ord. MC-1246, 5-21-07; Ord. 2102, 1956; Ord. 1925 §2, 1951.)

8.54.030 Issuance of Written Notice and Impoundment.

A. Any officer who encounters a violation of this section may issue a written notice to the Responsible Person demanding immediate abatement of the violation. The written notice shall inform the recipient that a second violation of the same provision within a seventy two (72) hour period may result in the issuance of a criminal citation, the imposition of criminal and civil penalties, and confiscation and impoundment, as evidence, of the components that are amplifying or transmitting the prohibited noise.

1. Responsible Person means (a) any person who owns, leases, or is lawfully in charge of the property or motor vehicle where the noise violation takes place, or (b) any person who owns or controls the source of the noise or violation. If the Responsible Person is a minor, then the parent or guardian who has custody of the child at the time of the violation shall be the Responsible Person who is liable under this chapter.

B. Any officer who encounters a second violation of this chapter within a seventy two (72) hour period following the issuance of a written notice is empowered to confiscate and impound, as evidence, any or all of the components amplifying or transmitting the sound. The immediate confiscation of a motor vehicle to which a component is attached may be made if the same may not be removed without causing harm to the vehicle or component.

C. Any person claiming legal ownership of the items confiscated and impounded under this chapter may request the return of the item by filing a written request with the police department within seven (7) calendar days of the confiscation. Such requests shall be processed in accordance with the procedures adopted by the department.

(Ord. MC-1246, 5-21-07; Ord. MC-649, 1-3-89; Ord. 1925 §3, 1951.)

8.54.040 Cost Recovery for Second Response.

A. Whenever any officer issues a written notice to a responsible person to discontinue a noise violation, the Responsible Person shall be liable for the actual cost of each subsequent response required to abate the violation within seventy two (72) hours of the issuance of the written warning.

B. The bill for the response charge shall be served upon the Responsible Person within thirty (30) days after the violation. If the Responsible Person has no last known business or residence address, the location of the violation shall be deemed to be the proper address for service. The bill shall include a notice of the right of the person being charged to request a hearing to dispute the imposition of the response charge or the amount of the charge.

C. The response charge shall be deemed to be a civil debt to the City.
(Ord. MC-1246, 5-21-07; Ord. MC-460, 5-13-85; Ord. 1925 §5, 1951.)

8.54.050 Controlled Hours of Operation.

It shall be unlawful for any person to engage in the following activities other than between the hours of 8:00 a.m. and 8:00 p.m. in residential zones and other than between the hours of 7:00 a.m. and 8:00 p.m. in all other zones:

A. Operate or permit the use of powered model vehicles and planes.

B. Load or unload any vehicle, or operate or permit the use of dollies, carts, forklifts, or other wheeled equipment that causes any impulsive sound, raucous, or unnecessary noise within one thousand (1,000) feet of a residence.

C. Operate or permit the use of domestic power tools, or machinery or any other equipment or tool in any garage, workshop, house, or any other structure.

D. Operate or permit the use of gasoline or electric powered leaf blowers, such as commonly used by gardeners and other persons for cleaning lawns, yards, driveways, gutters, and other property.

E. Operate or permit the use of privately operated street/parking lot sweepers or vacuums, except that emergency work and/or work necessitated by unusual conditions may be performed with the written consent of the City Manager.

F. Operate or permit the use of electrically operated compressor, fan, and other similar devices.

G. Operate or permit the use of any motor vehicle with a gross vehicle weight rating in excess of ten thousand (10,000) pounds, or of any auxiliary equipment attached to such a vehicle, including, but not limited to, refrigerated truck compressors for a period longer than fifteen (15) minutes in any hour while the vehicle is stationary and on a public right-of-way or public space except when movement of said vehicle is restricted by other traffic.

H. Repair, rebuild, reconstruct, or dismantle any motor vehicle or other mechanical equipment or devices in a manner so as to be plainly audible across property lines.
(Ord. MC-1246, 5-21-07)

8.54.060 Exemptions.

The following activities and noise sources shall be exempt from the provisions of this chapter:

A. The use of horns, sirens, or other signaling or warning devices by persons vested with legal authority to use the same, and in pursuit of their lawful duties, such as on ambulances, fire, police, or other governmental or official equipment.

B. Such noises as are an accompaniment and effect of a lawful business, commercial or industrial enterprise carried on in an area zoned for that purpose, except where there is evidence that such noise is a nuisance and that such a nuisance is a result of the employment of unnecessary and injurious methods of operation.

C. Activities conducted on the grounds of any public or private school during regular hours of operation.

D. Outdoor gatherings, public dances, shows, and sporting and entertainment events provided said events are authorized by the City.

E. Activities conducted at public spaces during regular hours of operation.

F. Any mechanical devices, apparatus, or equipment used, related to, or connected with emergency machinery, vehicle, or work.

G. Construction, repair, or excavation necessary for the immediate preservation of life or property.

H. Construction, operation, maintenance, and repairs of equipment, apparatus, or facilities of park and recreation departments, public work projects, or essential public services and facilities, including, but not limited to, trash collection and those of public utilities subject to the regulatory jurisdiction of the California Public Utilities Commission.

I. Construction, repair, or excavation work performed pursuant to a valid written agreement with the City, or any of its political subdivisions, which provides for noise mitigation measures.

J. Any activity to the extent that regulation thereof has been preempted by State or Federal law.

K. Sounds generated in connection with speech or communication protected by the United States Constitution or the California Constitution, except to the extent such sounds are subject to permissible time, place, and manner restrictions.

(Ord. MC-1246, 5-21-07)

8.54.070 Disturbances from Construction Activity.

No person shall be engaged or employed, or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours of 7:00 a.m. and 8:00 p.m. (Ord. MC-1246, 5-21-07)

8.54.080 Violation - Penalty.

Any person violating any of the provisions of this Chapter is guilty of an infraction or a misdemeanor, which upon conviction thereof is punishable in accordance with the provisions of Section 1.12.010 of this code. (Ord. MC-1246, 5-21-07)

APPENDIX 5.1:

STUDY AREA PHOTOS

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L1
34, 12' 0.304800", 117, 21' 57.837500"

L1_SW
34, 12' 0.304800", 117, 21' 57.837500"

L1_W
34, 12' 0.304800", 117, 21' 57.837500"

L2
,

L2_E
34, 11' 48.013900", 117, 21' 47.592700"

L2_NE
34, 11' 48.013900", 117, 21' 47.592700"

L2_NE2
34, 11' 50.980200", 117, 21' 45.450400"

L2_SW
34, 11' 48.013900", 117, 21' 47.592700"

L2_SW2
34, 11' 48.013900", 117, 21' 47.592700"

L2_W
34, 11' 48.013900", 117, 21' 47.592700"

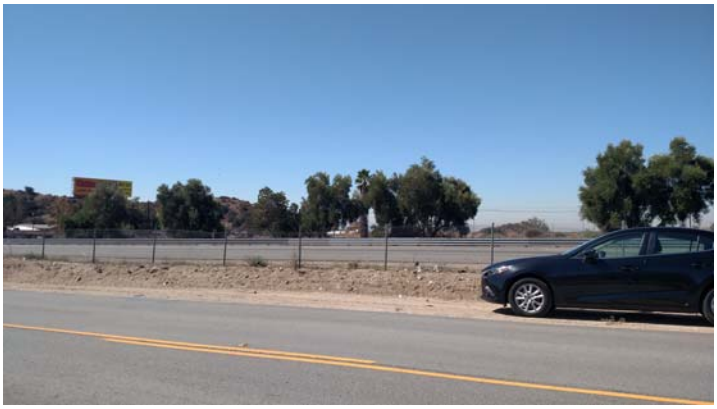
L3
34, 11' 45.995100", 117, 22' 3.248200"

L3_E
34, 11' 45.995100", 117, 22' 3.248200"

L3_N
34, 11' 45.995100", 117, 22' 3.248200"

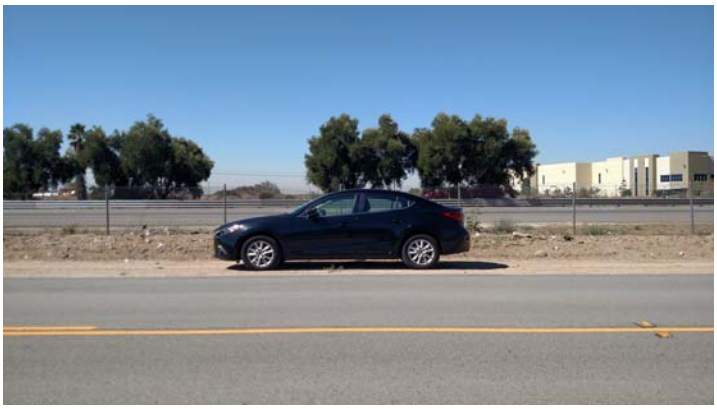
L3_NE
34, 11' 45.995100", 117, 22' 3.248200"

L3_NW
34, 11' 45.995100", 117, 22' 3.248200"



L3_S
34, 11' 45.995100", 117, 22' 3.248200"

L3_SE
34, 11' 45.995100", 117, 22' 3.248200"



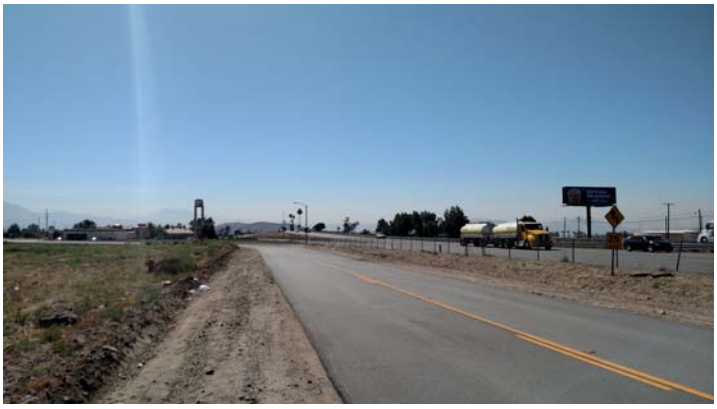
L3_SW
34, 11' 45.995100", 117, 22' 3.248200"

L3_W
34, 11' 45.995100", 117, 22' 3.248200"

L4
34, 11' 38.071200", 117, 21' 53.250700"

L4_N
34, 11' 38.071200", 117, 21' 53.250700"

L4_NE
34, 11' 38.071200", 117, 21' 53.250700"



L4_SE
34, 11' 38.071200", 117, 21' 53.250700"

L4_W2
34, 11' 38.071200", 117, 21' 53.250700"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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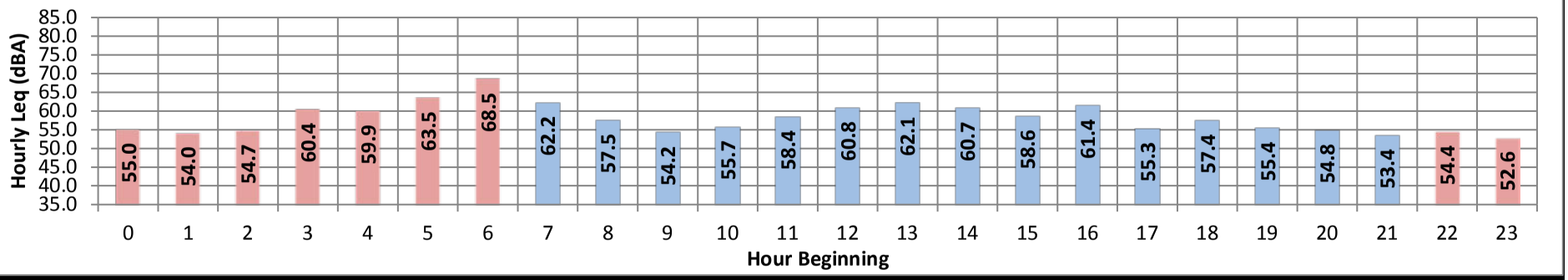
24-Hour Noise Level Measurement Summary

			Energy Average Leq		24-Hour
Project Name: Rancho Palma	*JN:* 9785		*Day*	*Night*	*CNEL*
Location: L1 - Located north of the Project site adjacent to an existing barrier for residential homes and across Magnolia Avenue from Cesar E. Chavez Middle School.	*Analyst:* A. Wolfe		58.8	61.5	67.7
	Date: 8/18/2015				

Hourly Leq dBA Readings (unadjusted)



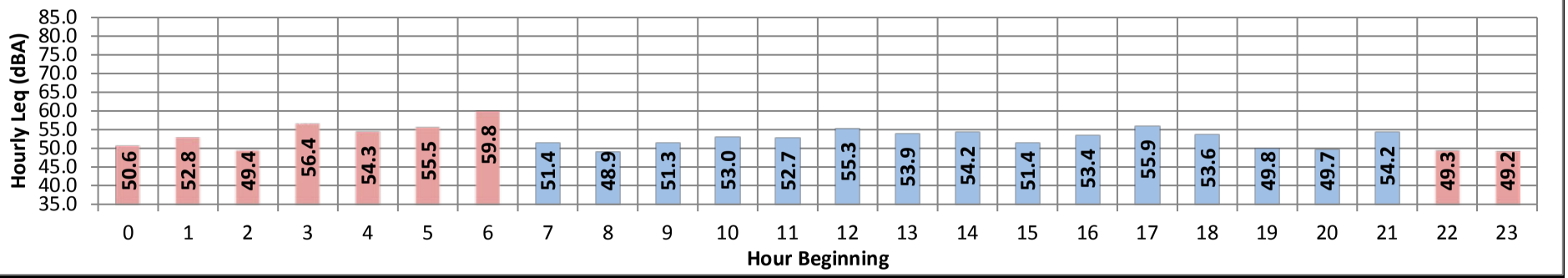
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	53.4	70.6	41.9	61.0	59.0	57.0	55.0	52.0	49.0	45.0	44.0	43.0
	Max	62.2	89.0	50.3	73.0	71.0	68.0	65.0	61.0	58.0	54.0	53.0	52.0
Energy Average:		58.8	Average:		66.8	64.5	61.5	58.8	55.5	52.7	49.3	48.3	46.9
Night	Min	52.6	61.3	42.1	59.0	58.0	56.0	55.0	52.0	48.0	45.0	45.0	43.0
	Max	68.5	93.3	52.8	77.0	74.0	72.0	70.0	67.0	64.0	57.0	56.0	54.0
Energy Average:		61.5	Average:		65.7	64.3	62.0	60.0	57.2	54.6	50.0	48.9	47.2
Hourly Summary													
Night	0	55.0	79.2	43.4	65.0	63.0	60.0	56.0	52.0	48.0	45.0	45.0	44.0
	1	54.0	74.4	42.5	63.0	61.0	59.0	56.0	53.0	50.0	46.0	45.0	43.0
	2	54.7	66.0	44.6	62.0	61.0	59.0	57.0	55.0	53.0	47.0	46.0	45.0
	3	60.4	71.4	50.6	67.0	67.0	65.0	63.0	60.0	58.0	55.0	54.0	53.0
	4	59.9	69.3	48.2	64.0	64.0	63.0	62.0	61.0	58.0	55.0	54.0	51.0
	5	63.5	87.7	52.8	71.0	69.0	65.0	63.0	61.0	60.0	57.0	56.0	54.0
	6	68.5	93.3	47.0	77.0	74.0	72.0	70.0	67.0	64.0	53.0	50.0	48.0
Day	7	62.2	81.9	45.0	73.0	71.0	68.0	65.0	59.0	52.0	48.0	47.0	46.0
	8	57.5	84.1	43.1	67.0	65.0	62.0	58.0	53.0	50.0	46.0	45.0	44.0
	9	54.2	76.8	43.4	65.0	63.0	58.0	55.0	52.0	49.0	46.0	45.0	44.0
	10	55.7	72.6	42.6	66.0	65.0	62.0	59.0	54.0	49.0	45.0	44.0	43.0
	11	58.4	83.6	41.9	68.0	66.0	63.0	60.0	55.0	52.0	46.0	45.0	43.0
	12	60.8	87.9	48.6	70.0	67.0	63.0	61.0	57.0	54.0	51.0	50.0	49.0
	13	62.1	84.0	50.3	71.0	69.0	66.0	64.0	61.0	58.0	54.0	53.0	51.0
	14	60.7	83.3	49.8	70.0	67.0	64.0	61.0	58.0	56.0	54.0	53.0	52.0
	15	58.6	81.3	48.7	67.0	65.0	63.0	60.0	57.0	55.0	52.0	51.0	49.0
	16	61.4	89.0	45.9	69.0	66.0	62.0	58.0	55.0	54.0	50.0	49.0	47.0
	17	55.3	79.7	46.7	63.0	60.0	57.0	55.0	54.0	52.0	50.0	49.0	48.0
	18	57.4	70.6	50.2	65.0	63.0	61.0	59.0	57.0	55.0	53.0	52.0	51.0
	19	55.4	76.9	44.2	65.0	61.0	58.0	56.0	54.0	52.0	50.0	49.0	47.0
	20	54.8	75.9	45.2	62.0	60.0	58.0	56.0	54.0	53.0	49.0	48.0	47.0
	21	53.4	71.2	42.5	61.0	59.0	57.0	55.0	53.0	50.0	46.0	45.0	43.0
Night	22	54.4	73.8	42.1	63.0	62.0	59.0	58.0	53.0	49.0	46.0	45.0	43.0
	23	52.6	61.3	43.3	59.0	58.0	56.0	55.0	53.0	51.0	46.0	45.0	44.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

				Energy Average Leq		24-Hour
Project Name:	Rancho Palma	*JN:*	9785	*Day*	*Night*	*CNEL*
Location:	L2 - Located north of the Project site on Chestnut Avenue near existing residential homes and the Ronald Reagan Park.	*Analyst:*	A. Wolfe	53.0	54.6	60.9
		Date:	8/18/2015			

Hourly Leq dBA Readings (unadjusted)



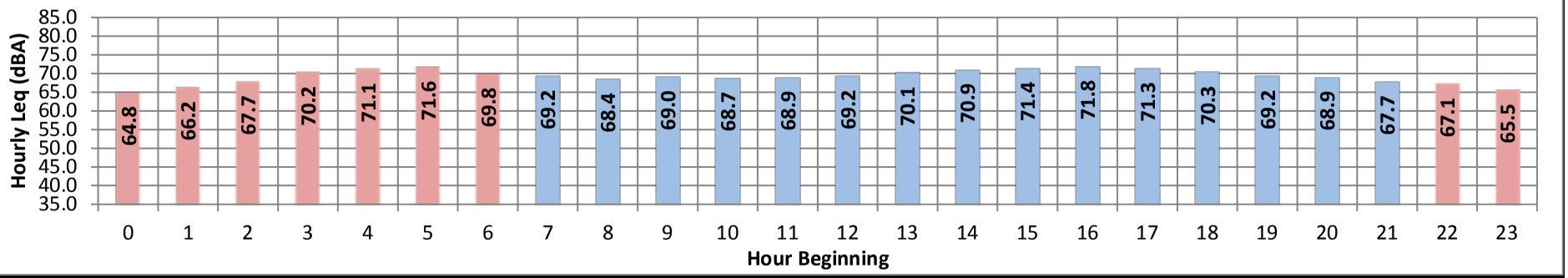
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	48.9	65.6	40.6	57.0	54.0	51.0	50.0	47.0	45.0	43.0	42.0	41.0
	Max	55.9	86.6	46.5	64.0	61.0	58.0	56.0	53.0	52.0	49.0	48.0	47.0
Energy Average:		53.0	Average:		60.7	57.9	54.3	52.2	49.9	48.1	45.3	44.6	43.5
Night	Min	49.2	65.6	40.6	55.0	54.0	53.0	51.0	48.0	46.0	42.0	41.0	40.0
	Max	59.8	88.0	48.5	68.0	66.0	63.0	59.0	57.0	54.0	52.0	51.0	50.0
Energy Average:		54.6	Average:		61.0	59.2	56.9	54.7	51.9	49.8	46.0	45.4	44.3
Hourly Summary													
Night	0	50.6	67.7	40.6	60.0	59.0	56.0	53.0	49.0	46.0	42.0	41.0	40.0
	1	52.8	70.0	41.4	64.0	61.0	57.0	54.0	51.0	48.0	43.0	43.0	42.0
	2	49.4	67.3	41.6	55.0	54.0	53.0	52.0	49.0	48.0	44.0	43.0	42.0
	3	56.4	65.6	47.2	63.0	62.0	61.0	59.0	57.0	54.0	50.0	50.0	49.0
	4	54.3	66.7	47.6	60.0	59.0	58.0	56.0	54.0	53.0	50.0	50.0	48.0
	5	55.5	70.2	48.5	62.0	61.0	58.0	57.0	55.0	54.0	52.0	51.0	50.0
	6	59.8	88.0	44.5	68.0	66.0	63.0	59.0	55.0	53.0	47.0	46.0	45.0
Day	7	51.4	72.9	42.4	63.0	59.0	54.0	50.0	48.0	47.0	45.0	44.0	43.0
	8	48.9	69.2	41.9	57.0	55.0	52.0	50.0	48.0	46.0	44.0	43.0	42.0
	9	51.3	72.5	41.6	64.0	58.0	52.0	50.0	47.0	46.0	43.0	43.0	42.0
	10	53.0	83.5	40.7	58.0	56.0	53.0	50.0	48.0	45.0	43.0	43.0	41.0
	11	52.7	76.7	41.6	61.0	59.0	55.0	53.0	50.0	48.0	44.0	43.0	42.0
	12	55.3	83.4	43.6	62.0	59.0	56.0	54.0	51.0	49.0	46.0	45.0	44.0
	13	53.9	72.2	44.2	63.0	61.0	58.0	55.0	53.0	51.0	47.0	47.0	45.0
	14	54.2	71.8	46.5	64.0	61.0	57.0	55.0	53.0	51.0	49.0	48.0	47.0
	15	51.4	65.6	43.6	59.0	57.0	55.0	53.0	51.0	49.0	46.0	45.0	44.0
	16	53.4	76.7	43.6	63.0	61.0	56.0	53.0	51.0	49.0	46.0	45.0	44.0
	17	55.9	86.6	43.6	62.0	59.0	55.0	53.0	51.0	49.0	46.0	46.0	44.0
	18	53.6	69.8	45.4	61.0	60.0	57.0	56.0	53.0	52.0	48.0	48.0	47.0
	19	49.8	71.6	42.5	57.0	55.0	52.0	50.0	49.0	47.0	45.0	44.0	44.0
	20	49.7	71.9	41.6	59.0	55.0	52.0	51.0	48.0	46.0	44.0	43.0	43.0
	21	54.2	83.5	40.6	57.0	54.0	51.0	50.0	48.0	46.0	43.0	42.0	41.0
Night	22	49.3	66.9	40.6	60.0	55.0	53.0	51.0	48.0	46.0	43.0	42.0	41.0
	23	49.2	68.4	40.7	57.0	56.0	53.0	51.0	49.0	46.0	43.0	43.0	42.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

				Energy Average Leq		24-Hour
Project Name:	Rancho Palma	*JN:*	9785	*Day*	*Night*	*CNEL*
Location:	L3 - Located south of Guhin Park at the Project site boundary on Little League Drive north of the Interstate 215 Freeway.	*Analyst:*	A. Wolfe	69.8	68.9	75.7
		Date:	8/18/2015			

Hourly Leq dBA Readings (unadjusted)



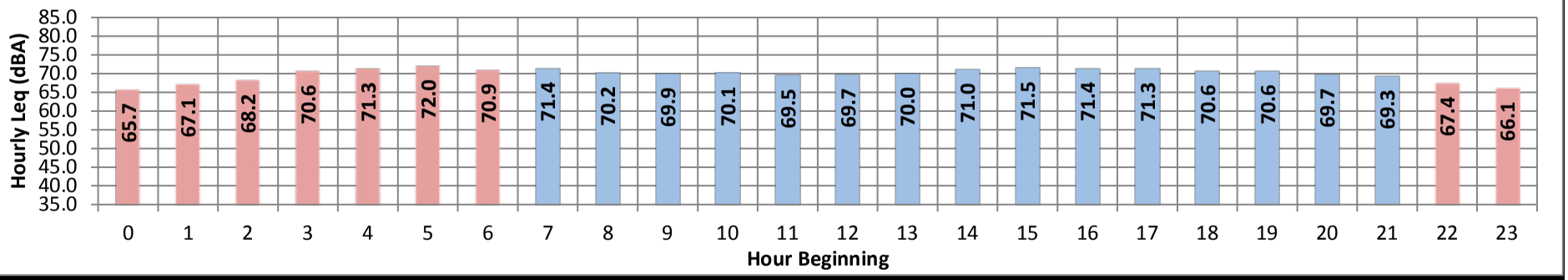
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	67.7	82.5	46.3	76.0	75.0	73.0	71.0	67.0	64.0	57.0	54.0	49.0
	Max	71.8	93.7	60.4	79.0	77.0	75.0	74.0	72.0	70.0	66.0	65.0	63.0
Energy Average:		69.8	Average:		77.3	76.1	74.3	72.6	69.4	66.6	60.9	59.3	56.1
Night	Min	64.8	79.8	43.3	74.0	73.0	71.0	68.0	64.0	60.0	52.0	51.0	46.0
	Max	71.6	87.8	61.9	78.0	77.0	76.0	74.0	72.0	69.0	66.0	64.0	63.0
Energy Average:		68.9	Average:		76.7	75.6	73.3	71.0	67.8	64.4	58.3	56.6	53.8
Hourly Summary													
Night	0	64.8	81.3	45.6	74.0	73.0	71.0	68.0	64.0	60.0	52.0	51.0	47.0
	1	66.2	79.8	49.0	76.0	75.0	72.0	69.0	65.0	61.0	55.0	53.0	51.0
	2	67.7	87.8	50.3	78.0	76.0	73.0	70.0	66.0	63.0	56.0	54.0	52.0
	3	70.2	83.4	54.8	78.0	77.0	75.0	73.0	70.0	67.0	62.0	60.0	58.0
	4	71.1	86.0	57.2	78.0	77.0	75.0	74.0	71.0	69.0	65.0	64.0	61.0
	5	71.6	86.1	61.9	78.0	77.0	76.0	74.0	72.0	69.0	66.0	64.0	63.0
	6	69.8	84.4	52.9	77.0	76.0	74.0	73.0	70.0	67.0	63.0	61.0	58.0
Day	7	69.2	84.1	52.4	77.0	76.0	74.0	72.0	69.0	66.0	60.0	59.0	56.0
	8	68.4	82.8	52.0	76.0	75.0	74.0	72.0	68.0	65.0	59.0	58.0	55.0
	9	69.0	84.9	50.8	77.0	76.0	74.0	72.0	69.0	65.0	59.0	57.0	53.0
	10	68.7	82.7	48.2	77.0	76.0	74.0	72.0	68.0	65.0	59.0	57.0	53.0
	11	68.9	84.4	50.4	77.0	76.0	74.0	72.0	69.0	65.0	59.0	58.0	55.0
	12	69.2	85.9	47.9	77.0	76.0	74.0	72.0	69.0	66.0	60.0	58.0	55.0
	13	70.1	93.7	51.2	77.0	76.0	74.0	73.0	70.0	67.0	61.0	59.0	55.0
	14	70.9	87.5	55.2	78.0	77.0	75.0	74.0	71.0	68.0	64.0	62.0	59.0
	15	71.4	89.7	55.0	79.0	77.0	75.0	74.0	71.0	69.0	65.0	63.0	61.0
	16	71.8	84.9	60.4	78.0	77.0	75.0	74.0	72.0	70.0	66.0	65.0	63.0
	17	71.3	89.0	55.5	78.0	77.0	75.0	74.0	71.0	69.0	64.0	63.0	60.0
	18	70.3	82.7	54.5	78.0	76.0	75.0	73.0	70.0	68.0	63.0	61.0	59.0
	19	69.2	82.5	53.1	77.0	76.0	74.0	72.0	69.0	67.0	60.0	59.0	56.0
	20	68.9	84.5	48.2	78.0	76.0	74.0	72.0	68.0	65.0	58.0	57.0	53.0
	21	67.7	87.1	46.3	76.0	75.0	73.0	71.0	67.0	64.0	57.0	54.0	49.0
Night	22	67.1	84.8	44.5	76.0	75.0	73.0	70.0	67.0	63.0	53.0	51.0	48.0
	23	65.5	81.8	43.3	75.0	74.0	71.0	68.0	65.0	61.0	53.0	51.0	46.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

			Energy Average Leq		24-Hour
Project Name:	Rancho Palma	*JN:* 9785	*Day*	*Night*	*CNEL*
Location:	L4 - Located at the Project site boundary on Little League Drive north of the Interstate 215 Freeway.	*Analyst:* A. Wolfe	70.5	69.4	76.3
		Date: 8/18/2015			

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	69.3	83.0	49.9	77.0	75.0	74.0	71.0	69.0	66.0	60.0	58.0	55.0
	Max	71.5	93.5	57.6	80.0	78.0	76.0	74.0	71.0	69.0	66.0	65.0	62.0
Energy Average:		70.5	Average:		78.1	76.6	74.7	72.9	70.1	67.3	62.4	60.9	57.7
Night	Min	65.7	79.3	44.6	75.0	74.0	71.0	68.0	65.0	61.0	55.0	53.0	49.0
	Max	72.0	88.9	62.0	80.0	78.0	76.0	74.0	72.0	69.0	66.0	65.0	64.0
Energy Average:		69.4	Average:		77.2	75.9	73.8	71.8	68.2	65.1	60.2	58.9	56.4
Hourly Summary													
Night	0	65.7	82.2	44.6	75.0	74.0	71.0	69.0	65.0	61.0	55.0	53.0	49.0
	1	67.1	80.3	48.3	76.0	75.0	73.0	71.0	66.0	63.0	57.0	55.0	51.0
	2	68.2	88.9	49.8	78.0	76.0	74.0	71.0	67.0	63.0	56.0	54.0	52.0
	3	70.6	86.1	58.4	78.0	77.0	75.0	74.0	70.0	67.0	63.0	62.0	60.0
	4	71.3	83.7	60.2	79.0	77.0	76.0	74.0	71.0	69.0	65.0	64.0	62.0
	5	72.0	88.0	62.0	80.0	78.0	76.0	74.0	72.0	69.0	66.0	65.0	64.0
	6	70.9	84.5	55.7	78.0	77.0	75.0	74.0	71.0	68.0	64.0	63.0	60.0
Day	7	71.4	93.5	51.2	80.0	78.0	76.0	74.0	71.0	67.0	62.0	61.0	57.0
	8	70.2	91.0	52.4	78.0	77.0	75.0	73.0	70.0	67.0	61.0	59.0	56.0
	9	69.9	84.8	51.4	78.0	77.0	75.0	73.0	70.0	66.0	60.0	59.0	55.0
	10	70.1	92.9	49.9	77.0	76.0	75.0	73.0	69.0	66.0	60.0	58.0	55.0
	11	69.5	86.0	52.6	78.0	76.0	74.0	72.0	69.0	66.0	60.0	59.0	56.0
	12	69.7	91.3	53.6	78.0	76.0	74.0	72.0	69.0	66.0	60.9	59.0	57.0
	13	70.0	86.1	53.4	78.0	76.0	74.0	73.0	70.0	67.0	62.0	60.0	57.0
	14	71.0	88.7	57.4	79.0	77.0	75.0	73.0	71.0	68.0	63.0	62.0	60.0
	15	71.5	92.2	56.6	79.0	77.0	75.0	73.0	71.0	69.0	65.0	63.0	60.0
	16	71.4	86.5	57.6	78.0	77.0	75.0	74.0	71.0	69.0	66.0	65.0	62.0
	17	71.3	92.0	54.7	78.0	77.0	75.0	73.0	71.0	69.0	65.0	63.0	60.0
	18	70.6	91.7	51.7	78.0	77.0	75.0	73.0	70.0	68.0	63.0	61.0	57.0
	19	70.6	83.0	54.7	77.0	76.0	74.0	73.0	71.0	69.0	64.0	63.0	58.0
	20	69.7	84.9	56.4	78.0	77.0	75.0	73.0	69.0	66.0	61.0	60.0	58.0
	21	69.3	87.8	55.6	77.0	75.0	74.0	71.0	69.0	67.0	63.0	61.0	58.0
Night	22	67.4	79.3	52.9	76.0	75.0	73.0	71.0	67.0	64.0	59.0	58.0	55.0
	23	66.1	83.3	50.9	75.0	74.0	71.0	68.0	65.0	62.0	57.0	56.0	55.0

URBAN CROSSROADS

APPENDIX 6.1:

SITE PLAN

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MAGNOLIA AVENUE
STREET "A"
STREET "B"
STREET "C"
STREET "D"
STREET "E"
STREET "F"
STREET "G"
STREET "H"
STREET "I"
STREET "J"
STREET "K"
STREET "L"
PROPERTY LINE
I-215 FREEWAY
LITTLE EAGLE DRIVE
CHANNEL
CREEK
CABLE
ARTHUR PLAIN
PARK LOT "A"
PARK LOT "B"
PARK LOT "C"
RV PARKING
WOLFE BASIN ROAD
PROPOSED STORM DRAIN
EX. 24" D.I.P. WATER
EX. 8" D.I.P. WATER
EX. 15" SEWER (EX)
EX. 8" SEWER (EX)

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APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: N. Little League Dr.
Road Segment: n/o W. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	190	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-8.07	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-25.31	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-29.27	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.3	54.4	52.6	46.6	55.2	55.8
Medium Trucks:	50.6	49.0	42.7	41.1	49.6	49.8
Heavy Trucks:	52.4	51.0	42.0	43.2	51.6	51.7
Vehicle Noise:	58.5	56.8	53.4	49.0	57.5	58.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	14	30	65
CNEL:	7	15	32	69

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: N. Little League Dr.
Road Segment: s/o W. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	230	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.24	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.48	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.44	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.1	55.2	53.5	47.4	56.0	56.6
Medium Trucks:	51.4	49.9	43.5	42.0	50.4	50.7
Heavy Trucks:	53.2	51.8	42.8	44.0	52.4	52.5
Vehicle Noise:	59.4	57.7	54.2	49.8	58.4	58.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	16	34	74
CNEL:	8	17	37	79

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Palm Av.
Road Segment: n/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	380	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.60	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-20.84	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-24.79	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.2	53.3	51.5	45.5	54.1	54.7
Medium Trucks:	50.1	48.6	42.2	40.7	49.1	49.3
Heavy Trucks:	53.3	51.9	42.8	44.1	52.4	52.6
Vehicle Noise:	58.1	56.4	52.5	48.6	57.1	57.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	61
CNEL:	6	14	30	65

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Palm Av.
Road Segment: s/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	680	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.63	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.86	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.82	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.9	63.0	61.2	55.2	63.8	64.4
Medium Trucks:	58.7	57.2	50.8	49.3	57.7	58.0
Heavy Trucks:	59.5	58.1	49.1	50.3	58.7	58.8
Vehicle Noise:	66.8	65.0	61.9	57.2	65.7	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	106	228
CNEL:	24	53	114	245

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Irvington Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,280 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.88	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.12	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.07	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.7	65.8	64.0	57.9	66.6	67.2
Medium Trucks:	61.4	59.9	53.6	52.0	60.5	60.7
Heavy Trucks:	62.3	60.9	51.8	53.1	61.4	61.6
Vehicle Noise:	69.5	67.8	64.6	59.9	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	75	162	348
CNEL:	37	80	173	373

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,540 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.08	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.31	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.27	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.5	66.6	64.8	58.7	67.4	68.0
Medium Trucks:	62.2	60.7	54.4	52.8	61.3	61.5
Heavy Trucks:	63.1	61.7	52.6	53.9	62.2	62.4
Vehicle Noise:	70.3	68.6	65.4	60.7	69.3	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	85	183	394
CNEL:	42	91	196	422

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,320 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.70	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.53	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.49	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.2	68.3	66.6	60.5	69.1	69.7
Medium Trucks:	64.0	62.5	56.2	54.6	63.1	63.3
Heavy Trucks:	64.9	63.4	54.4	55.7	64.0	64.1
Vehicle Noise:	72.1	70.3	67.2	62.5	71.1	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	112	240	518
CNEL:	56	120	258	555

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,800 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.60	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.64	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.59	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	67.2	65.5	59.4	68.0	68.6
Medium Trucks:	62.9	61.4	55.1	53.5	62.0	62.2
Heavy Trucks:	63.8	62.3	53.3	54.6	62.9	63.0
Vehicle Noise:	71.0	69.2	66.1	61.4	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	94	203	437
CNEL:	47	101	218	469

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Palm Av.
Road Segment: n/o Hallmark Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	890 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.46	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.70	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.65	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.2	62.4	56.4	65.0	65.6
Medium Trucks:	59.9	58.4	52.0	50.5	58.9	59.1
Heavy Trucks:	60.7	59.3	50.3	51.5	59.9	60.0
Vehicle Noise:	67.9	66.2	63.0	58.4	66.9	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	59	127	273
CNEL:	29	63	136	293

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Palm Av.
Road Segment: s/o Hallmark Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	490 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-5.05	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-22.29	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.24	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.5	61.6	59.8	53.8	62.4	63.0
Medium Trucks:	57.3	55.8	49.4	47.9	56.3	56.6
Heavy Trucks:	58.1	56.7	47.7	48.9	57.3	57.4
Vehicle Noise:	65.3	63.6	60.4	55.8	64.3	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	40	85	184
CNEL:	20	42	91	197

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Pine Av.
Road Segment: n/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	270 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.64	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-24.88	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.83	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.9	59.0	57.2	51.2	59.8	60.4
Medium Trucks:	54.7	53.2	46.8	45.3	53.7	54.0
Heavy Trucks:	55.5	54.1	45.1	46.3	54.7	54.8
Vehicle Noise:	62.7	61.0	57.8	53.2	61.7	62.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	27	57	123
CNEL:	13	29	61	132

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Pine Av.
Road Segment: s/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	410 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-5.82	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-23.06	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-27.02	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.7	60.8	59.0	53.0	61.6	62.2
Medium Trucks:	56.5	55.0	48.6	47.1	55.5	55.8
Heavy Trucks:	57.3	55.9	46.9	48.1	56.5	56.6
Vehicle Noise:	64.6	62.8	59.7	55.0	63.5	64.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	35	76	163
CNEL:	17	38	81	175

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Pine Av.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	820	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.81	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.05	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.01	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.7	63.8	62.1	56.0	64.6	65.2
Medium Trucks:	59.5	58.0	51.6	50.1	58.6	58.8
Heavy Trucks:	60.4	58.9	49.9	51.1	59.5	59.6
Vehicle Noise:	67.6	65.8	62.7	58.0	66.5	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	56	120	259
CNEL:	28	60	129	278

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Campus Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	500	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.96	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-22.20	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.16	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.6	61.7	59.9	53.9	62.5	63.1
Medium Trucks:	57.4	55.9	49.5	47.9	56.4	56.6
Heavy Trucks:	58.2	56.8	47.7	49.0	57.4	57.5
Vehicle Noise:	65.4	63.7	60.5	55.9	64.4	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	40	86	186
CNEL:	20	43	93	200

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: University Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,950	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.75	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.49	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.45	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.3	69.4	67.6	61.6	70.2	70.8
Medium Trucks:	65.1	63.6	57.2	55.7	64.1	64.4
Heavy Trucks:	65.9	64.5	55.5	56.7	65.1	65.2
Vehicle Noise:	73.2	71.4	68.3	63.6	72.1	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	149	322	693
CNEL:	74	160	345	743

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: University Pkwy.
Road Segment: s/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,710	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.74	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.50	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.45	1.33	-1.20	-5.43	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:	72.3	70.4	68.6	62.6	71.2	71.8
Medium Trucks:	66.1	64.6	58.2	56.7	65.1	65.4
Heavy Trucks:	66.9	65.5	56.5	57.7	66.1	66.2
Vehicle Noise:	74.1	72.4	69.3	64.6	73.1	73.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	81	174	375	807
CNEL:	87	187	402	866

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	250 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.42	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.66	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.61	3.57	-1.20	-5.77	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:	55.6	53.7	52.0	45.9	54.5	55.1
Medium Trucks:	50.5	49.0	42.6	41.1	49.6	49.8
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	58.5	56.9	52.9	49.0	57.5	57.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	10	21	44
CNEL:	5	10	22	47

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	240 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.60	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.83	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.79	3.57	-1.20	-5.77	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:	55.4	53.5	51.8	45.7	54.3	55.0
Medium Trucks:	50.3	48.8	42.5	40.9	49.4	49.6
Heavy Trucks:	53.6	52.1	43.1	44.3	52.7	52.8
Vehicle Noise:	58.4	56.7	52.8	48.9	57.4	57.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	9	20	43
CNEL:	5	10	21	46

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	130 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-8.26	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-25.50	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-29.45	3.57	-1.20	-5.77	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:	52.8	50.9	49.1	43.1	51.7	52.3
Medium Trucks:	47.7	46.2	39.8	38.3	46.7	47.0
Heavy Trucks:	50.9	49.5	40.4	41.7	50.0	50.2
Vehicle Noise:	55.7	54.0	50.1	46.2	54.7	55.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	3	6	13	29
CNEL:	3	7	14	30

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	370 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.72	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.95	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.91	3.57	-1.20	-5.77	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:	57.3	55.4	53.7	47.6	56.2	56.8
Medium Trucks:	52.2	50.7	44.4	42.8	51.3	51.5
Heavy Trucks:	55.4	54.0	45.0	46.2	54.6	54.7
Vehicle Noise:	60.2	58.6	54.6	50.7	59.2	59.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	27	58
CNEL:	6	13	28	61

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Irvington Av.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	340 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.08	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.32	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.28	3.57	-1.20	-5.77	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:	57.0	55.1	53.3	47.2	55.9	56.5
Medium Trucks:	51.9	50.3	44.0	42.4	50.9	51.1
Heavy Trucks:	55.1	53.6	44.6	45.9	54.2	54.3
Vehicle Noise:	59.9	58.2	54.3	50.4	58.9	59.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	12	25	54
CNEL:	6	12	27	58

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: W. Little League Dr.
Road Segment: w/o Magnolia Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	220 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.97	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.21	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.17	3.57	-1.20	-5.77	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:	55.1	53.2	51.4	45.3	54.0	54.6
Medium Trucks:	50.0	48.5	42.1	40.5	49.0	49.2
Heavy Trucks:	53.2	51.8	42.7	44.0	52.3	52.4
Vehicle Noise:	58.0	56.3	52.4	48.5	57.0	57.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	9	19	41
CNEL:	4	9	20	43

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Kendall Dr.
Road Segment: w/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	870 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.56	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.79	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.75	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.0	64.1	62.3	56.3	64.9	65.5
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.0
Heavy Trucks:	60.6	59.2	50.2	51.4	59.8	59.9
Vehicle Noise:	67.8	66.1	62.9	58.3	66.8	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	58	125	269
CNEL:	29	62	134	289

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Kendall Dr.
Road Segment: e/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	720 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.38	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.62	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.57	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.2	63.3	61.5	55.4	64.1	64.7
Medium Trucks:	58.9	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	59.8	58.4	49.3	50.6	58.9	59.1
Vehicle Noise:	67.0	65.3	62.1	57.4	66.0	66.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	51	110	237
CNEL:	25	55	118	254

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: W. Little League Dr.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	210 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-8.73	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-25.97	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-29.92	3.57	-1.20	-5.77	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:	55.9	54.4	48.0	46.4	54.9	55.1
Heavy Trucks:	56.7	55.3	46.2	47.5	55.8	56.0
Vehicle Noise:	63.9	62.2	59.0	54.3	62.9	63.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	10	22	47	100
CNEL:	11	23	50	108

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Kendall Dr.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,560 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.02	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.26	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.21	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.5	66.6	64.9	58.8	67.4	68.0
Medium Trucks:	62.3	60.8	54.5	52.9	61.4	61.6
Heavy Trucks:	63.2	61.7	52.7	54.0	62.3	62.4
Vehicle Noise:	70.4	68.6	65.5	60.8	69.4	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	98	210	453
CNEL:	49	105	226	486

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Kendall Dr.
Road Segment: w/o Pine Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,410 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.46	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.70	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.65	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.1	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	61.9	60.4	54.0	52.5	60.9	61.2
Heavy Trucks:	62.7	61.3	52.3	53.5	61.9	62.0
Vehicle Noise:	69.9	68.2	65.0	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	91	197	424
CNEL:	45	98	211	454

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Kendall Dr.
Road Segment: w/o Campus Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,960 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.97	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.27	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.22	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.9	59.8	68.4	69.0
Medium Trucks:	63.3	61.8	55.4	53.9	62.4	62.6
Heavy Trucks:	64.2	62.7	53.7	55.0	63.3	63.4
Vehicle Noise:	71.4	69.6	66.5	61.8	70.4	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	245	528
CNEL:	57	122	263	566

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Kendall Dr.
Road Segment: w/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,920	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	*Grade Adjustment:* 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.88	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.36	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.31	1.33	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.4	67.5	65.8	59.7	68.3	69.0
Medium Trucks:	63.2	61.7	55.4	53.8	62.3	62.5
Heavy Trucks:	64.1	62.7	53.6	54.9	63.2	63.3
Vehicle Noise:	71.3	69.5	66.4	61.7	70.3	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	52	112	242	520
CNEL:	56	120	259	558

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Kendall Dr.
Road Segment: e/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

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:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	*Grade Adjustment:* 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.58	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.66	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.62	1.33	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.1	67.2	65.5	59.4	68.0	68.6
Medium Trucks:	62.9	61.4	55.1	53.5	62.0	62.2
Heavy Trucks:	63.8	62.3	53.3	54.6	62.9	63.0
Vehicle Noise:	71.0	69.2	66.1	61.4	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	50	107	231	497
CNEL:	53	115	247	533

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: I-215 Fwy.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	36,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,670	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	*Grade Adjustment:* 0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.77	1.47	0.27	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	85.95	-12.39	0.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	88.97	-10.79	0.29	-1.20	*-5.32*	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:	76.3	74.4	72.7	66.6	75.2	75.8
Medium Trucks:	72.7	71.2	64.8	63.2	71.7	71.9
Heavy Trucks:	77.3	75.9	66.8	68.1	76.4	76.6
Vehicle Noise:	80.6	79.0	74.2	71.2	79.6	80.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	272	586	1,264	2,722
CNEL:	286	616	1,328	2,860

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: I-215 Fwy.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	43,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,380	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	*Grade Adjustment:* 0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.77	2.24	0.27	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	85.95	-11.62	0.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	88.97	-10.02	0.29	-1.20	*-5.32*	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:	77.1	75.2	73.4	67.4	76.0	76.6
Medium Trucks:	73.4	71.9	65.6	64.0	72.5	72.7
Heavy Trucks:	78.0	76.6	67.6	68.8	77.2	77.3
Vehicle Noise:	81.4	79.8	75.0	71.9	80.4	80.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	306	660	1,422	3,063
CNEL:	322	693	1,494	3,218

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: n/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	190 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-8.07	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-25.31	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-29.27	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.3	54.4	52.6	46.6	55.2	55.8
Medium Trucks:	50.6	49.0	42.7	41.1	49.6	49.8
Heavy Trucks:	52.4	51.0	42.0	43.2	51.6	51.7
Vehicle Noise:	58.5	56.8	53.4	49.0	57.5	58.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	14	30	65
CNEL:	7	15	32	69

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: s/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	250 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.88	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.12	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.07	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.5	55.6	53.8	47.8	56.4	57.0
Medium Trucks:	51.7	50.2	43.9	42.3	50.8	51.0
Heavy Trucks:	53.6	52.2	43.1	44.4	52.7	52.9
Vehicle Noise:	59.7	58.0	54.6	50.2	58.7	59.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	17	36	78
CNEL:	8	18	39	83

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	380 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.60	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-20.84	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-24.79	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.2	53.3	51.5	45.5	54.1	54.7
Medium Trucks:	50.1	48.6	42.2	40.7	49.1	49.3
Heavy Trucks:	53.3	51.9	42.8	44.1	52.4	52.6
Vehicle Noise:	58.1	56.4	52.5	48.6	57.1	57.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	61
CNEL:	6	14	30	65

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	690 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.56	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.80	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.76	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.0	63.1	61.3	55.3	63.9	64.5
Medium Trucks:	58.8	57.3	50.9	49.3	57.8	58.0
Heavy Trucks:	59.6	58.2	49.1	50.4	58.8	58.9
Vehicle Noise:	66.8	65.1	61.9	57.2	65.8	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	50	107	231
CNEL:	25	53	115	247

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Irvington Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,290	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.85	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.08	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.04	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.7	65.8	64.0	58.0	66.6	67.2
Medium Trucks:	61.5	60.0	53.6	52.1	60.5	60.8
Heavy Trucks:	62.3	60.9	51.9	53.1	61.5	61.6
Vehicle Noise:	69.5	67.8	64.6	60.0	68.5	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	75	162	350
CNEL:	38	81	174	375

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,540	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.08	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.31	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.27	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.5	66.6	64.8	58.7	67.4	68.0
Medium Trucks:	62.2	60.7	54.4	52.8	61.3	61.5
Heavy Trucks:	63.1	61.7	52.6	53.9	62.2	62.4
Vehicle Noise:	70.3	68.6	65.4	60.7	69.3	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	85	183	394
CNEL:	42	91	196	422

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,390	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.83	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.41	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.36	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.4	68.5	66.7	60.6	69.3	69.9
Medium Trucks:	64.2	62.6	56.3	54.7	63.2	63.4
Heavy Trucks:	65.0	63.6	54.5	55.8	64.1	64.3
Vehicle Noise:	72.2	70.5	67.3	62.6	71.2	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	245	528
CNEL:	57	122	263	566

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,830	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.67	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.56	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.52	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.2	67.3	65.5	59.5	68.1	68.7
Medium Trucks:	63.0	61.5	55.1	53.6	62.0	62.3
Heavy Trucks:	63.8	62.4	53.4	54.6	63.0	63.1
Vehicle Noise:	71.1	69.3	66.2	61.5	70.0	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	205	442
CNEL:	47	102	220	474

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	890	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.46	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.70	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.65	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.2	62.4	56.4	65.0	65.6
Medium Trucks:	59.9	58.4	52.0	50.5	58.9	59.1
Heavy Trucks:	60.7	59.3	50.3	51.5	59.9	60.0
Vehicle Noise:	67.9	66.2	63.0	58.4	66.9	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	59	127	273
CNEL:	29	63	136	293

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	500	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.96	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-22.20	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.16	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.6	61.7	59.9	53.9	62.5	63.1
Medium Trucks:	57.4	55.9	49.5	47.9	56.4	56.6
Heavy Trucks:	58.2	56.8	47.7	49.0	57.4	57.5
Vehicle Noise:	65.4	63.7	60.5	55.9	64.4	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	40	86	186
CNEL:	20	43	93	200

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	270	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.64	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-24.88	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.83	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.9	59.0	57.2	51.2	59.8	60.4
Medium Trucks:	54.7	53.2	46.8	45.3	53.7	54.0
Heavy Trucks:	55.5	54.1	45.1	46.3	54.7	54.8
Vehicle Noise:	62.7	61.0	57.8	53.2	61.7	62.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	27	57	123
CNEL:	13	29	61	132

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	410	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-5.82	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-23.06	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-27.02	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.7	60.8	59.0	53.0	61.6	62.2
Medium Trucks:	56.5	55.0	48.6	47.1	55.5	55.8
Heavy Trucks:	57.3	55.9	46.9	48.1	56.5	56.6
Vehicle Noise:	64.6	62.8	59.7	55.0	63.5	64.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	35	76	163
CNEL:	17	38	81	175

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	820	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.81	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-20.05	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-24.01	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.7	63.8	62.1	56.0	64.6	65.2
Medium Trucks:	59.5	58.0	51.6	50.1	58.6	58.8
Heavy Trucks:	60.4	58.9	49.9	51.1	59.5	59.6
Vehicle Noise:	67.6	65.8	62.7	58.0	66.5	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	56	120	259
CNEL:	28	60	129	278

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Campus Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	510	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.88	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-22.11	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-26.07	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.7	61.8	60.0	53.9	62.6	63.2
Medium Trucks:	57.4	55.9	49.6	48.0	56.5	56.7
Heavy Trucks:	58.3	56.9	47.8	49.1	57.4	57.6
Vehicle Noise:	65.5	63.8	60.6	55.9	64.5	64.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	88	189
CNEL:	20	44	94	202

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,950	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.75	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-14.49	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-18.45	1.33	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.3	69.4	67.6	61.6	70.2	70.8
Medium Trucks:	65.1	63.6	57.2	55.7	64.1	64.4
Heavy Trucks:	65.9	64.5	55.5	56.7	65.1	65.2
Vehicle Noise:	73.2	71.4	68.3	63.6	72.1	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	149	322	693
CNEL:	74	160	345	743

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: s/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,720	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.75	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-13.48	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-17.44	1.33	-1.20	*-5.43*	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:	72.3	70.4	68.6	62.6	71.2	71.8
Medium Trucks:	66.1	64.6	58.2	56.7	65.1	65.4
Heavy Trucks:	66.9	65.5	56.5	57.7	66.1	66.2
Vehicle Noise:	74.2	72.4	69.3	64.6	73.1	73.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	81	174	375	809
CNEL:	87	187	403	867

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: Belmont Av.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	250	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-5.42	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-22.66	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.61	3.57	-1.20	*-5.77*	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:	55.6	53.7	52.0	45.9	54.5	55.1
Medium Trucks:	50.5	49.0	42.6	41.1	49.6	49.8
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	58.5	56.9	52.9	49.0	57.5	57.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	4	10	21	44
CNEL:	5	10	22	47

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: Belmont Av.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	240	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-5.60	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-22.83	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.79	3.57	-1.20	*-5.77*	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:	55.4	53.5	51.8	45.7	54.3	55.0
Medium Trucks:	50.3	48.8	42.5	40.9	49.4	49.6
Heavy Trucks:	53.6	52.1	43.1	44.3	52.7	52.8
Vehicle Noise:	58.4	56.7	52.8	48.9	57.4	57.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	4	9	20	43
CNEL:	5	10	21	46

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: Belmont Av.
Road Segment: w/o Pine Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	130	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.26	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-25.50	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-29.45	3.57	-1.20	*-5.77*	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:	52.8	50.9	49.1	43.1	51.7	52.3
Medium Trucks:	47.7	46.2	39.8	38.3	46.7	47.0
Heavy Trucks:	50.9	49.5	40.4	41.7	50.0	50.2
Vehicle Noise:	55.7	54.0	50.1	46.2	54.7	55.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	3	6	13	29
CNEL:	3	7	14	30

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: Irvington Av.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	370	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-3.72	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-20.95	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-24.91	3.57	-1.20	*-5.77*	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:	57.3	55.4	53.7	47.6	56.2	56.8
Medium Trucks:	52.2	50.7	44.4	42.8	51.3	51.5
Heavy Trucks:	55.4	54.0	45.0	46.2	54.6	54.7
Vehicle Noise:	60.2	58.6	54.6	50.7	59.2	59.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	12	27	58
CNEL:	6	13	28	61

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: Irvington Av.
Road Segment: e/o Palm Av.

Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	340	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-4.08	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-21.32	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-25.28	3.57	-1.20	*-5.77*	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:	57.0	55.1	53.3	47.2	55.9	56.5
Medium Trucks:	51.9	50.3	44.0	42.4	50.9	51.1
Heavy Trucks:	55.1	53.6	44.6	45.9	54.2	54.3
Vehicle Noise:	59.9	58.2	54.3	50.4	58.9	59.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	5	12	25	54
CNEL:	6	12	27	58

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: W. Little League Dr.
Road Segment: w/o Magnolia Av.

Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	240	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-5.60	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-22.83	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.79	3.57	-1.20	*-5.77*	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:	55.4	53.5	51.8	45.7	54.3	55.0
Medium Trucks:	50.3	48.8	42.5	40.9	49.4	49.6
Heavy Trucks:	53.6	52.1	43.1	44.3	52.7	52.8
Vehicle Noise:	58.4	56.7	52.8	48.9	57.4	57.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	4	9	20	43
CNEL:	5	10	21	46

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: Kendall Dr.
Road Segment: w/o N. Little League Dr.

Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.56	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-19.79	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.75	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.0	64.1	62.3	56.3	64.9	65.5
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.0
Heavy Trucks:	60.6	59.2	50.2	51.4	59.8	59.9
Vehicle Noise:	67.8	66.1	62.9	58.3	66.8	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	58	125	269
CNEL:	29	62	134	289

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: Kendall Dr.
Road Segment: e/o N. Little League Dr.

Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	730	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.32	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-20.56	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-24.51	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.2	63.3	61.6	55.5	64.1	64.7
Medium Trucks:	59.0	57.5	51.1	49.6	58.1	58.3
Heavy Trucks:	59.8	58.4	49.4	50.6	59.0	59.1
Vehicle Noise:	67.1	65.3	62.2	57.5	66.0	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	52	111	239
CNEL:	26	55	119	257

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	300 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.18	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-24.42	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-28.37	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.6	61.7	59.9	53.9	62.5	63.1
Medium Trucks:	57.4	55.9	49.5	48.0	56.5	56.7
Heavy Trucks:	58.3	56.8	47.8	49.0	57.4	57.5
Vehicle Noise:	65.4	63.7	60.5	55.9	64.4	64.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	27	59	127
CNEL:	14	29	63	137

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,580 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.04	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.20	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.16	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.6	66.7	64.9	58.9	67.5	68.1
Medium Trucks:	62.4	60.9	54.5	53.0	61.4	61.7
Heavy Trucks:	63.2	61.8	52.8	54.0	62.4	62.5
Vehicle Noise:	70.4	68.7	65.5	60.9	69.4	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	46	98	212	457
CNEL:	49	106	228	490

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,430 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.40	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.64	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.59	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.2	66.3	64.5	58.4	67.1	67.7
Medium Trucks:	61.9	60.4	54.1	52.5	61.0	61.2
Heavy Trucks:	62.8	61.4	52.3	53.6	61.9	62.1
Vehicle Noise:	70.0	68.3	65.1	60.4	69.0	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	92	198	428
CNEL:	46	99	213	459

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1) | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Campus Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,980 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.02	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.22	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.18	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	63.4	61.9	55.5	53.9	62.4	62.6
Heavy Trucks:	64.2	62.8	53.7	55.0	63.4	63.5
Vehicle Noise:	71.4	69.7	66.5	61.9	70.4	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	247	531
CNEL:	57	123	264	570

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: Kendall Dr.
Road Segment: w/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,930	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.90	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.33	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.29	1.33	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.5	67.6	65.8	59.7	68.4	69.0
Medium Trucks:	63.3	61.7	55.4	53.8	62.3	62.5
Heavy Trucks:	64.1	62.7	53.6	54.9	63.2	63.4
Vehicle Noise:	71.3	69.6	66.4	61.7	70.3	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	52	113	242	522
CNEL:	56	121	260	560

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: Kendall Dr.
Road Segment: e/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

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:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.58	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.66	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.62	1.33	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.1	67.2	65.5	59.4	68.0	68.6
Medium Trucks:	62.9	61.4	55.1	53.5	62.0	62.2
Heavy Trucks:	63.8	62.3	53.3	54.6	62.9	63.0
Vehicle Noise:	71.0	69.2	66.1	61.4	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	50	107	231	497
CNEL:	53	115	247	533

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: I-215 Fwy.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,700	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.77	1.51	0.27	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	85.95	-12.36	0.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	88.97	-10.75	0.29	-1.20	*-5.32*	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:	76.4	74.5	72.7	66.6	75.3	75.9
Medium Trucks:	72.7	71.2	64.8	63.3	71.7	72.0
Heavy Trucks:	77.3	75.9	66.9	68.1	76.5	76.6
Vehicle Noise:	80.6	79.0	74.2	71.2	79.7	80.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	274	590	1,270	2,737
CNEL:	288	620	1,335	2,876

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Phase 1)
Road Name: I-215 Fwy.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	44,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,410	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.77	2.27	0.27	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	85.95	-11.59	0.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	88.97	-9.99	0.29	-1.20	*-5.32*	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:	77.1	75.2	73.4	67.4	76.0	76.6
Medium Trucks:	73.5	71.9	65.6	64.0	72.5	72.7
Heavy Trucks:	78.1	76.7	67.6	68.9	77.2	77.4
Vehicle Noise:	81.4	79.8	75.0	72.0	80.4	80.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	308	663	1,428	3,077
CNEL:	323	697	1,501	3,233

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout)
Road Name: N. Little League Dr.
Road Segment: n/o W. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	210 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.64	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.88	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.83	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	54.8	53.1	47.0	55.6	56.2
Medium Trucks:	51.0	49.5	43.1	41.6	50.0	50.3
Heavy Trucks:	52.8	51.4	42.4	43.6	52.0	52.1
Vehicle Noise:	59.0	57.3	53.8	49.4	58.0	58.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	15	32	69
CNEL:	7	16	34	74

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout)
Road Name: N. Little League Dr.
Road Segment: s/o W. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	300 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.09	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-23.33	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-27.28	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.3	56.4	54.6	48.6	57.2	57.8
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	54.4	53.0	43.9	45.2	53.5	53.7
Vehicle Noise:	60.5	58.8	55.4	51.0	59.5	59.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	41	88
CNEL:	9	20	44	94

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout)
Road Name: Palm Av.
Road Segment: n/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	400 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.38	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-20.62	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-24.57	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.4	53.5	51.8	45.7	54.3	54.9
Medium Trucks:	50.3	48.8	42.4	40.9	49.3	49.6
Heavy Trucks:	53.5	52.1	43.1	44.3	52.7	52.8
Vehicle Noise:	58.3	56.7	52.7	48.8	57.3	57.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	14	29	63
CNEL:	7	14	31	67

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout)
Road Name: Palm Av.
Road Segment: s/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	750 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.20	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.44	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.39	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.3	63.4	61.7	55.6	64.2	64.8
Medium Trucks:	59.1	57.6	51.3	49.7	58.2	58.4
Heavy Trucks:	60.0	58.5	49.5	50.8	59.1	59.2
Vehicle Noise:	67.2	65.4	62.3	57.6	66.2	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	53	113	244
CNEL:	26	56	121	262

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Irvington Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,370	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.58	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.82	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.78	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.1	64.3	58.2	66.9	67.5
Medium Trucks:	61.7	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	62.6	61.2	52.1	53.4	61.7	61.9
Vehicle Noise:	69.8	68.1	64.9	60.2	68.8	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	78	169	364
CNEL:	39	84	181	391

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,630	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.17	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.07	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.02	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.7	66.8	65.0	59.0	67.6	68.2
Medium Trucks:	62.5	61.0	54.6	53.1	61.5	61.8
Heavy Trucks:	63.3	61.9	52.9	54.1	62.5	62.6
Vehicle Noise:	70.6	68.8	65.7	61.0	69.5	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	88	190	409
CNEL:	44	95	204	439

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,480	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.99	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.24	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.20	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	68.6	66.9	60.8	69.4	70.0
Medium Trucks:	64.3	62.8	56.4	54.9	63.4	63.6
Heavy Trucks:	65.2	63.7	54.7	56.0	64.3	64.4
Vehicle Noise:	72.4	70.6	67.5	62.8	71.3	71.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	117	251	541
CNEL:	58	125	269	580

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,900	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.84	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.40	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.36	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.4	67.5	65.7	59.7	68.3	68.9
Medium Trucks:	63.2	61.7	55.3	53.7	62.2	62.4
Heavy Trucks:	64.0	62.6	53.5	54.8	63.1	63.3
Vehicle Noise:	71.2	69.5	66.3	61.6	70.2	70.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	98	210	453
CNEL:	49	105	226	486

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	930	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.27	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-19.50	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.46	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.6	56.6	65.2	65.8
Medium Trucks:	60.1	58.5	52.2	50.6	59.1	59.3
Heavy Trucks:	60.9	59.5	50.4	51.7	60.0	60.2
Vehicle Noise:	68.1	66.4	63.2	58.5	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	131	281
CNEL:	30	65	140	302

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	520	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.79	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-22.03	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-25.99	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.7	61.8	60.1	54.0	62.6	63.3
Medium Trucks:	57.5	56.0	49.7	48.1	56.6	56.8
Heavy Trucks:	58.4	57.0	47.9	49.2	57.5	57.6
Vehicle Noise:	65.6	63.8	60.7	56.0	64.6	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	89	191
CNEL:	20	44	95	205

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	290	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.33	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-24.57	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-28.52	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.2	59.3	57.5	51.5	60.1	60.7
Medium Trucks:	55.0	53.5	47.1	45.6	54.0	54.3
Heavy Trucks:	55.8	54.4	45.4	46.6	55.0	55.1
Vehicle Noise:	63.1	61.3	58.2	53.5	62.0	62.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	28	60	129
CNEL:	14	30	64	139

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	470	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-5.23	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-22.47	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-26.42	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.3	61.4	59.6	53.6	62.2	62.8
Medium Trucks:	57.1	55.6	49.2	47.7	56.1	56.4
Heavy Trucks:	57.9	56.5	47.5	48.7	57.1	57.2
Vehicle Noise:	65.2	63.4	60.3	55.6	64.1	64.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	38	83	179
CNEL:	19	41	89	192

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	880	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.51	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.74	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.70	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.0	64.1	62.4	56.3	64.9	65.5
Medium Trucks:	59.8	58.3	51.9	50.4	58.9	59.1
Heavy Trucks:	60.7	59.2	50.2	51.5	59.8	59.9
Vehicle Noise:	67.9	66.1	63.0	58.3	66.8	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	58	126	271
CNEL:	29	63	135	291

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Campus Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	510	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.88	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-22.11	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.07	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.7	61.8	60.0	53.9	62.6	63.2
Medium Trucks:	57.4	55.9	49.6	48.0	56.5	56.7
Heavy Trucks:	58.3	56.9	47.8	49.1	57.4	57.6
Vehicle Noise:	65.5	63.8	60.6	55.9	64.5	64.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	88	189
CNEL:	20	44	94	202

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,960	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.76	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.48	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.43	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.3	69.4	67.7	61.6	70.2	70.8
Medium Trucks:	65.1	63.6	57.2	55.7	64.2	64.4
Heavy Trucks:	66.0	64.5	55.5	56.7	65.1	65.2
Vehicle Noise:	73.2	71.4	68.3	63.6	72.1	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	150	322	694
CNEL:	74	160	346	745

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: s/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,740	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.78	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.46	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.42	1.33	-1.20	-5.43	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:	72.3	70.4	68.7	62.6	71.2	71.8
Medium Trucks:	66.1	64.6	58.3	56.7	65.2	65.4
Heavy Trucks:	67.0	65.5	56.5	57.8	66.1	66.2
Vehicle Noise:	74.2	72.4	69.3	64.6	73.2	73.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	81	175	377	812
CNEL:	87	188	404	871

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	270	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.08	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.32	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.28	3.57	-1.20	-5.77	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:	56.0	54.1	52.3	46.2	54.9	55.5
Medium Trucks:	50.9	49.3	43.0	41.4	49.9	50.1
Heavy Trucks:	54.1	52.6	43.6	44.9	53.2	53.3
Vehicle Noise:	58.9	57.2	53.3	49.4	57.9	58.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	22	47
CNEL:	5	11	23	50

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	260	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.25	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.49	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.44	3.57	-1.20	-5.77	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:	55.8	53.9	52.1	46.1	54.7	55.3
Medium Trucks:	50.7	49.2	42.8	41.3	49.7	50.0
Heavy Trucks:	53.9	52.5	43.4	44.7	53.0	53.2
Vehicle Noise:	58.7	57.0	53.1	49.2	57.7	58.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	21	46
CNEL:	5	10	22	48

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	170	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.09	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-24.33	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-28.29	3.57	-1.20	-5.77	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:	53.9	52.0	50.3	44.2	52.9	53.5
Medium Trucks:	48.8	47.3	41.0	39.4	47.9	48.1
Heavy Trucks:	52.1	50.6	41.6	42.8	51.2	51.3
Vehicle Noise:	56.9	55.2	51.3	47.4	55.9	56.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	3	7	16	34
CNEL:	4	8	17	36

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	380	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.60	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.84	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.79	3.57	-1.20	-5.77	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:	57.4	55.5	53.8	47.7	56.3	57.0
Medium Trucks:	52.3	50.8	44.5	42.9	51.4	51.6
Heavy Trucks:	55.5	54.1	45.1	46.3	54.7	54.8
Vehicle Noise:	60.4	58.7	54.8	50.9	59.4	59.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	27	59
CNEL:	6	13	29	62

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	350	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.96	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.20	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.15	3.57	-1.20	-5.77	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:	57.1	55.2	53.4	47.4	56.0	56.6
Medium Trucks:	52.0	50.5	44.1	42.6	51.0	51.3
Heavy Trucks:	55.2	53.8	44.7	46.0	54.3	54.5
Vehicle Noise:	60.0	58.3	54.4	50.5	59.0	59.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	26	55
CNEL:	6	13	27	59

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Magnolia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	310	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.48	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.72	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.68	3.57	-1.20	-5.77	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:	56.6	54.7	52.9	46.8	55.5	56.1
Medium Trucks:	51.5	49.9	43.6	42.0	50.5	50.7
Heavy Trucks:	54.7	53.2	44.2	45.5	53.8	53.9
Vehicle Noise:	59.5	57.8	53.9	50.0	58.5	58.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	11	24	51
CNEL:	5	12	25	54

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	900	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.41	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.65	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.60	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.2	62.5	56.4	65.0	65.6
Medium Trucks:	59.9	58.4	52.0	50.5	59.0	59.2
Heavy Trucks:	60.8	59.3	50.3	51.5	59.9	60.0
Vehicle Noise:	68.0	66.2	63.1	58.4	66.9	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	59	128	275
CNEL:	30	64	137	295

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	750	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.20	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.44	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.39	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.3	63.4	61.7	55.6	64.2	64.8
Medium Trucks:	59.1	57.6	51.3	49.7	58.2	58.4
Heavy Trucks:	60.0	58.5	49.5	50.8	59.1	59.2
Vehicle Noise:	67.2	65.4	62.3	57.6	66.2	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	53	113	244
CNEL:	26	56	121	262

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	600	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.17	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-21.41	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-25.36	3.57	-1.20	-5.77	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:	60.4	58.9	52.6	51.0	59.5	59.7
Heavy Trucks:	61.3	59.8	50.8	52.1	60.4	60.5
Vehicle Noise:	68.5	66.7	63.6	58.9	67.4	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	44	94	202
CNEL:	22	47	101	217

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,700	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.35	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.88	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.84	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.0	65.2	59.2	67.8	68.4
Medium Trucks:	62.7	61.2	54.8	53.3	61.7	62.0
Heavy Trucks:	63.5	62.1	53.1	54.3	62.7	62.8
Vehicle Noise:	70.8	69.0	65.9	61.2	69.7	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	103	223	480
CNEL:	51	111	239	515

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,550	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.05	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.29	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.24	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.5	66.6	64.8	58.8	67.4	68.0
Medium Trucks:	62.3	60.8	54.4	52.9	61.3	61.6
Heavy Trucks:	63.1	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	70.4	68.6	65.5	60.8	69.3	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	97	209	451
CNEL:	48	104	225	484

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Campus Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,040	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.15	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.09	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.05	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	67.8	66.0	60.0	68.6	69.2
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.8
Heavy Trucks:	64.3	62.9	53.9	55.1	63.5	63.6
Vehicle Noise:	71.6	69.8	66.7	62.0	70.5	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	117	252	542
CNEL:	58	125	270	581

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,980	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.02	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.22	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.18	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	63.4	61.9	55.5	53.9	62.4	62.6
Heavy Trucks:	64.2	62.8	53.7	55.0	63.4	63.5
Vehicle Noise:	71.4	69.7	66.5	61.9	70.4	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	247	531
CNEL:	57	123	264	570

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,810	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.63	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.61	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.57	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.2	67.3	65.5	59.5	68.1	68.7
Medium Trucks:	63.0	61.5	55.1	53.6	62.0	62.3
Heavy Trucks:	63.8	62.4	53.4	54.6	63.0	63.1
Vehicle Noise:	71.0	69.3	66.1	61.5	70.0	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	108	232	500
CNEL:	54	116	249	537

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: I-215 Fwy. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,720	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	1.53	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-12.33	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-10.73	0.29	-1.20	-5.32	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:	76.4	74.5	72.7	66.7	75.3	75.9
Medium Trucks:	72.7	71.2	64.8	63.3	71.8	72.0
Heavy Trucks:	77.3	75.9	66.9	68.1	76.5	76.6
Vehicle Noise:	80.7	79.0	74.2	71.2	79.7	80.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	275	592	1,275	2,747
CNEL:	289	622	1,340	2,886

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P (Buildout) | Project Name: Rancho Palma
Road Name: I-215 Fwy. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	44,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,430	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	2.29	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-11.58	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-9.97	0.29	-1.20	-5.32	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:	77.1	75.2	73.5	67.4	76.0	76.6
Medium Trucks:	73.5	72.0	65.6	64.1	72.5	72.8
Heavy Trucks:	78.1	76.7	67.6	68.9	77.2	77.4
Vehicle Noise:	81.4	79.8	75.0	72.0	80.5	80.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	309	665	1,432	3,086
CNEL:	324	699	1,505	3,243

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: n/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	200	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.85	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-25.09	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-29.04	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.5	54.6	52.9	46.8	55.4	56.0
Medium Trucks:	50.8	49.3	42.9	41.4	49.8	50.1
Heavy Trucks:	52.6	51.2	42.2	43.4	51.8	51.9
Vehicle Noise:	58.8	57.0	53.6	49.2	57.8	58.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	14	31	67
CNEL:	7	15	33	72

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: s/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	250	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.88	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.12	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.07	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.5	55.6	53.8	47.8	56.4	57.0
Medium Trucks:	51.7	50.2	43.9	42.3	50.8	51.0
Heavy Trucks:	53.6	52.2	43.1	44.4	52.7	52.9
Vehicle Noise:	59.7	58.0	54.6	50.2	58.7	59.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	17	36	78
CNEL:	8	18	39	83

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	400	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.38	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-20.62	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-24.57	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.4	53.5	51.8	45.7	54.3	54.9
Medium Trucks:	50.3	48.8	42.4	40.9	49.3	49.6
Heavy Trucks:	53.5	52.1	43.1	44.3	52.7	52.8
Vehicle Noise:	58.3	56.7	52.7	48.8	57.3	57.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	14	29	63
CNEL:	7	14	31	67

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	720	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.38	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.62	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.57	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.2	63.3	61.5	55.4	64.1	64.7
Medium Trucks:	58.9	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	59.8	58.4	49.3	50.6	58.9	59.1
Vehicle Noise:	67.0	65.3	62.1	57.4	66.0	66.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	51	110	237
CNEL:	25	55	118	254

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Irvington Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,360	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.62	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.85	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.81	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.9	66.0	64.3	58.2	66.8	67.4
Medium Trucks:	61.7	60.2	53.8	52.3	60.8	61.0
Heavy Trucks:	62.6	61.1	52.1	53.3	61.7	61.8
Vehicle Noise:	69.8	68.0	64.9	60.2	68.7	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	78	168	363
CNEL:	39	84	181	389

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,630	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.17	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.07	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.02	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.7	66.8	65.0	59.0	67.6	68.2
Medium Trucks:	62.5	61.0	54.6	53.1	61.5	61.8
Heavy Trucks:	63.3	61.9	52.9	54.1	62.5	62.6
Vehicle Noise:	70.6	68.8	65.7	61.0	69.5	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	88	190	409
CNEL:	44	95	204	439

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o I-215 Fwy. NB Ramps

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:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.98	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.26	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.22	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	68.6	66.8	60.8	69.4	70.0
Medium Trucks:	64.3	62.8	56.4	54.9	63.3	63.6
Heavy Trucks:	65.1	63.7	54.7	55.9	64.3	64.4
Vehicle Noise:	72.4	70.6	67.5	62.8	71.3	71.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	116	251	540
CNEL:	58	125	269	579

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,910	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.86	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.38	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.33	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.4	67.5	65.7	59.7	68.3	68.9
Medium Trucks:	63.2	61.7	55.3	53.8	62.2	62.5
Heavy Trucks:	64.0	62.6	53.6	54.8	63.2	63.3
Vehicle Noise:	71.2	69.5	66.3	61.7	70.2	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	98	211	455
CNEL:	49	105	226	488

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	940	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.22	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-19.46	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.41	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.7	56.6	65.2	65.8
Medium Trucks:	60.1	58.6	52.2	50.7	59.1	59.4
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	68.2	66.4	63.3	58.6	67.1	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	132	283
CNEL:	30	65	141	304

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	530	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.71	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-21.95	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-25.90	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.8	61.9	60.2	54.1	62.7	63.3
Medium Trucks:	57.6	56.1	49.7	48.2	56.7	56.9
Heavy Trucks:	58.5	57.0	48.0	49.2	57.6	57.7
Vehicle Noise:	65.7	63.9	60.8	56.1	64.6	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	42	90	193
CNEL:	21	45	96	207

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	290	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.33	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-24.57	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-28.52	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.2	59.3	57.5	51.5	60.1	60.7
Medium Trucks:	55.0	53.5	47.1	45.6	54.0	54.3
Heavy Trucks:	55.8	54.4	45.4	46.6	55.0	55.1
Vehicle Noise:	63.1	61.3	58.2	53.5	62.0	62.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	28	60	129
CNEL:	14	30	64	139

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	430	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-5.62	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-22.85	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-26.81	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.9	61.0	59.3	53.2	61.8	62.4
Medium Trucks:	56.7	55.2	48.8	47.3	55.8	56.0
Heavy Trucks:	57.5	56.1	47.1	48.3	56.7	56.8
Vehicle Noise:	64.8	63.0	59.9	55.2	63.7	64.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	17	36	78	168
CNEL:	18	39	84	180

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.56	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.79	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.75	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.0	64.1	62.3	56.3	64.9	65.5
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.0
Heavy Trucks:	60.6	59.2	50.2	51.4	59.8	59.9
Vehicle Noise:	67.8	66.1	62.9	58.3	66.8	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	58	125	269
CNEL:	29	62	134	289

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Campus Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	530	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.71	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.95	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.90	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.8	61.9	60.2	54.1	62.7	63.3
Medium Trucks:	57.6	56.1	49.7	48.2	56.7	56.9
Heavy Trucks:	58.5	57.0	48.0	49.2	57.6	57.7
Vehicle Noise:	65.7	63.9	60.8	56.1	64.6	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	42	90	193
CNEL:	21	45	96	207

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,130	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.00	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.23	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.19	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.6	69.7	67.9	61.8	70.5	71.1
Medium Trucks:	65.4	63.8	57.5	55.9	64.4	64.6
Heavy Trucks:	66.2	64.8	55.7	57.0	65.3	65.5
Vehicle Noise:	73.4	71.7	68.5	63.8	72.4	72.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	155	335	721
CNEL:	77	167	359	773

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: s/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,940	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.00	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.23	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.19	1.33	-1.20	-5.43	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:	72.6	70.7	68.9	62.8	71.5	72.1
Medium Trucks:	66.4	64.8	58.5	56.9	65.4	65.6
Heavy Trucks:	67.2	65.8	56.7	58.0	66.3	66.5
Vehicle Noise:	74.4	72.7	69.5	64.8	73.4	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	181	390	840
CNEL:	90	194	418	901

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	260 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.25	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.49	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.44	3.57	-1.20	-5.77	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:	55.8	53.9	52.1	46.1	54.7	55.3
Medium Trucks:	50.7	49.2	42.8	41.3	49.7	50.0
Heavy Trucks:	53.9	52.5	43.4	44.7	53.0	53.2
Vehicle Noise:	58.7	57.0	53.1	49.2	57.7	58.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	21	46
CNEL:	5	10	22	48

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	250 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.42	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.66	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.61	3.57	-1.20	-5.77	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:	55.6	53.7	52.0	45.9	54.5	55.1
Medium Trucks:	50.5	49.0	42.6	41.1	49.6	49.8
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	58.5	56.9	52.9	49.0	57.5	57.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	10	21	44
CNEL:	5	10	22	47

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	140 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.94	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-25.18	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-29.13	3.57	-1.20	-5.77	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:	53.1	51.2	49.4	43.4	52.0	52.6
Medium Trucks:	48.0	46.5	40.1	38.6	47.0	47.3
Heavy Trucks:	51.2	49.8	40.8	42.0	50.4	50.5
Vehicle Noise:	56.0	54.3	50.4	46.5	55.0	55.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	3	6	14	30
CNEL:	3	7	15	32

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	400 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.38	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.62	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.57	3.57	-1.20	-5.77	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:	57.7	55.8	54.0	47.9	56.6	57.2
Medium Trucks:	52.6	51.1	44.7	43.1	51.6	51.8
Heavy Trucks:	55.8	54.4	45.3	46.6	54.9	55.0
Vehicle Noise:	60.6	58.9	55.0	51.1	59.6	60.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	61
CNEL:	6	14	30	64

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 *Project Name:* Rancho Palma
Road Name: Irvington Av. *Job Number:* 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	360	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-3.84	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-21.07	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-25.03	3.57	-1.20	*-5.77*	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:	57.2	55.3	53.5	47.5	56.1	56.7
Medium Trucks:	52.1	50.6	44.2	42.7	51.1	51.4
Heavy Trucks:	55.3	53.9	44.9	46.1	54.5	54.6
Vehicle Noise:	60.1	58.4	54.5	50.6	59.1	59.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	12	26	57
CNEL:	6	13	28	60

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 *Project Name:* Rancho Palma
Road Name: W. Little League Dr. *Job Number:* 9785
Road Segment: w/o Magnolia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	230	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-5.78	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-23.02	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.98	3.57	-1.20	*-5.77*	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:	55.3	53.4	51.6	45.5	54.2	54.8
Medium Trucks:	50.2	48.6	42.3	40.7	49.2	49.4
Heavy Trucks:	53.4	51.9	42.9	44.2	52.5	52.6
Vehicle Noise:	58.2	56.5	52.6	48.7	57.2	57.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	4	9	19	42
CNEL:	4	10	21	45

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 *Project Name:* Rancho Palma
Road Name: Kendall Dr. *Job Number:* 9785
Road Segment: w/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	920	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.31	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-19.55	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.51	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.6	56.5	65.1	65.7
Medium Trucks:	60.0	58.5	52.1	50.6	59.1	59.3
Heavy Trucks:	60.9	59.4	50.4	51.6	60.0	60.1
Vehicle Noise:	68.1	66.3	63.2	58.5	67.0	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	28	60	130	279
CNEL:	30	65	139	300

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 *Project Name:* Rancho Palma
Road Name: Kendall Dr. *Job Number:* 9785
Road Segment: e/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	760	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.14	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-20.38	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-24.34	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.4	63.5	61.7	55.7	64.3	64.9
Medium Trucks:	59.2	57.7	51.3	49.8	58.2	58.5
Heavy Trucks:	60.0	58.6	49.6	50.8	59.2	59.3
Vehicle Noise:	67.2	65.5	62.3	57.7	66.2	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	25	53	114	246
CNEL:	26	57	122	264

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	220	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-8.53	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-25.77	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-29.72	3.57	-1.20	-5.77	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:	62.2	60.3	58.6	52.5	61.1	61.7
Medium Trucks:	56.1	54.6	48.2	46.6	55.1	55.3
Heavy Trucks:	56.9	55.5	46.4	47.7	56.0	56.2
Vehicle Noise:	64.1	62.4	59.2	54.5	63.1	63.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	10	22	48	104
CNEL:	11	24	52	111

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,660	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.25	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.99	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.94	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.8	66.9	65.1	59.1	67.7	68.3
Medium Trucks:	62.6	61.1	54.7	53.2	61.6	61.9
Heavy Trucks:	63.4	62.0	53.0	54.2	62.6	62.7
Vehicle Noise:	70.7	68.9	65.8	61.1	69.6	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	102	219	472
CNEL:	51	109	235	507

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,500	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.19	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.43	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.38	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	66.5	64.7	58.7	67.3	67.9
Medium Trucks:	62.2	60.6	54.3	52.7	61.2	61.4
Heavy Trucks:	63.0	61.6	52.5	53.8	62.1	62.3
Vehicle Noise:	70.2	68.5	65.3	60.6	69.2	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	205	441
CNEL:	47	102	220	473

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Campus Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,080	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.23	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.01	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.96	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.8	67.9	66.1	60.1	68.7	69.3
Medium Trucks:	63.6	62.1	55.7	54.2	62.6	62.9
Heavy Trucks:	64.4	63.0	54.0	55.2	63.6	63.7
Vehicle Noise:	71.6	69.9	66.7	62.1	70.6	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	255	549
CNEL:	59	127	273	589

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,040	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.15	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.09	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.05	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	67.8	66.0	60.0	68.6	69.2
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.8
Heavy Trucks:	64.3	62.9	53.9	55.1	63.5	63.6
Vehicle Noise:	71.6	69.8	66.7	62.0	70.5	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	117	252	542
CNEL:	58	125	270	581

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,900	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.84	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.40	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.36	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.4	67.5	65.7	59.7	68.3	68.9
Medium Trucks:	63.2	61.7	55.3	53.8	62.2	62.5
Heavy Trucks:	64.0	62.6	53.6	54.8	63.2	63.3
Vehicle Noise:	71.2	69.5	66.3	61.7	70.2	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	111	240	517
CNEL:	55	119	257	554

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: I-215 Fwy. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,900	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	1.74	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-12.13	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-10.52	0.29	-1.20	-5.32	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:	76.6	74.7	72.9	66.9	75.5	76.1
Medium Trucks:	72.9	71.4	65.1	63.5	72.0	72.2
Heavy Trucks:	77.5	76.1	67.1	68.3	76.7	76.8
Vehicle Noise:	80.9	79.3	74.5	71.4	79.9	80.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	283	611	1,316	2,835
CNEL:	298	642	1,383	2,979

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2018 | Project Name: Rancho Palma
Road Name: I-215 Fwy. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	46,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,640	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	2.49	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-11.37	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-9.77	0.29	-1.20	-5.32	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:	77.3	75.4	73.7	67.6	76.2	76.8
Medium Trucks:	73.7	72.2	65.8	64.3	72.7	73.0
Heavy Trucks:	78.3	76.9	67.8	69.1	77.4	77.6
Vehicle Noise:	81.6	80.0	75.2	72.2	80.7	81.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	318	686	1,477	3,183
CNEL:	334	721	1,552	3,344

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: n/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	210	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.64	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.88	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.83	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	54.8	53.1	47.0	55.6	56.2
Medium Trucks:	51.0	49.5	43.1	41.6	50.0	50.3
Heavy Trucks:	52.8	51.4	42.4	43.6	52.0	52.1
Vehicle Noise:	59.0	57.3	53.8	49.4	58.0	58.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	15	32	69
CNEL:	7	16	34	74

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: s/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	270	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.55	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-23.78	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-27.74	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.8	55.9	54.2	48.1	56.7	57.3
Medium Trucks:	52.1	50.6	44.2	42.7	51.1	51.4
Heavy Trucks:	53.9	52.5	43.5	44.7	53.1	53.2
Vehicle Noise:	60.1	58.4	54.9	50.5	59.1	59.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	18	38	82
CNEL:	9	19	41	88

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	410	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.27	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-20.51	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-24.46	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.5	53.6	51.9	45.8	54.4	55.0
Medium Trucks:	50.4	48.9	42.5	41.0	49.4	49.7
Heavy Trucks:	53.6	52.2	43.2	44.4	52.8	52.9
Vehicle Noise:	58.4	56.8	52.8	48.9	57.4	57.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	14	30	64
CNEL:	7	15	32	68

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	730	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.32	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.56	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.51	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.2	63.3	61.6	55.5	64.1	64.7
Medium Trucks:	59.0	57.5	51.1	49.6	58.1	58.3
Heavy Trucks:	59.8	58.4	49.4	50.6	59.0	59.1
Vehicle Noise:	67.1	65.3	62.2	57.5	66.0	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	52	111	239
CNEL:	26	55	119	257

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Irvington Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,370	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.58	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.82	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.78	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.1	64.3	58.2	66.9	67.5
Medium Trucks:	61.7	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	62.6	61.2	52.1	53.4	61.7	61.9
Vehicle Noise:	69.8	68.1	64.9	60.2	68.8	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	78	169	364
CNEL:	39	84	181	391

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,640	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.20	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.04	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.00	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.7	66.8	65.1	59.0	67.6	68.2
Medium Trucks:	62.5	61.0	54.7	53.1	61.6	61.8
Heavy Trucks:	63.4	61.9	52.9	54.2	62.5	62.6
Vehicle Noise:	70.6	68.8	65.7	61.0	69.6	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	88	191	411
CNEL:	44	95	204	441

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,530	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.08	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.16	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.11	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.6	68.7	67.0	60.9	69.5	70.1
Medium Trucks:	64.4	62.9	56.5	55.0	63.4	63.7
Heavy Trucks:	65.2	63.8	54.8	56.0	64.4	64.5
Vehicle Noise:	72.5	70.7	67.6	62.9	71.4	71.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	255	548
CNEL:	59	127	273	588

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,940	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.93	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.31	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.27	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.7	68.4	69.0
Medium Trucks:	63.2	61.7	55.4	53.8	62.3	62.5
Heavy Trucks:	64.1	62.7	53.6	54.9	63.2	63.4
Vehicle Noise:	71.3	69.6	66.4	61.7	70.3	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	46	99	213	459
CNEL:	49	106	229	493

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	950	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.17	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.41	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.37	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.5	62.7	56.6	65.3	65.9
Medium Trucks:	60.1	58.6	52.3	50.7	59.2	59.4
Heavy Trucks:	61.0	59.6	50.5	51.8	60.1	60.3
Vehicle Noise:	68.2	66.5	63.3	58.6	67.2	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	61	132	285
CNEL:	31	66	142	306

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	530	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.71	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.95	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.90	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.8	61.9	60.2	54.1	62.7	63.3
Medium Trucks:	57.6	56.1	49.7	48.2	56.7	56.9
Heavy Trucks:	58.5	57.0	48.0	49.2	57.6	57.7
Vehicle Noise:	65.7	63.9	60.8	56.1	64.6	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	42	90	193
CNEL:	21	45	96	207

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	290	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.33	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-24.57	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.52	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.2	59.3	57.5	51.5	60.1	60.7
Medium Trucks:	55.0	53.5	47.1	45.6	54.0	54.3
Heavy Trucks:	55.8	54.4	45.4	46.6	55.0	55.1
Vehicle Noise:	63.1	61.3	58.2	53.5	62.0	62.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	28	60	129
CNEL:	14	30	64	139

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	430	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-5.62	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-22.85	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.81	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.9	61.0	59.3	53.2	61.8	62.4
Medium Trucks:	56.7	55.2	48.8	47.3	55.8	56.0
Heavy Trucks:	57.5	56.1	47.1	48.3	56.7	56.8
Vehicle Noise:	64.8	63.0	59.9	55.2	63.7	64.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	17	36	78	168
CNEL:	18	39	84	180

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018
Road Name: Pine Av.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.56	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.79	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.75	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.0	64.1	62.3	56.3	64.9	65.5
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.0
Heavy Trucks:	60.6	59.2	50.2	51.4	59.8	59.9
Vehicle Noise:	67.8	66.1	62.9	58.3	66.8	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	58	125	269
CNEL:	29	62	134	289

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018
Road Name: Campus Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

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:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.63	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.87	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.82	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.9	62.0	60.2	54.2	62.8	63.4
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	58.5	57.1	48.1	49.3	57.7	57.8
Vehicle Noise:	65.8	64.0	60.9	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	42	91	196
CNEL:	21	45	98	210

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018
Road Name: University Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,130	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.00	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.23	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.19	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.6	69.7	67.9	61.8	70.5	71.1
Medium Trucks:	65.4	63.8	57.5	55.9	64.4	64.6
Heavy Trucks:	66.2	64.8	55.7	57.0	65.3	65.5
Vehicle Noise:	73.4	71.7	68.5	63.8	72.4	72.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	155	335	721
CNEL:	77	167	359	773

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018
Road Name: University Pkwy.
Road Segment: s/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,950	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.01	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.22	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.18	1.33	-1.20	-5.43	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:	72.6	70.7	68.9	62.9	71.5	72.1
Medium Trucks:	66.4	64.9	58.5	56.9	65.4	65.6
Heavy Trucks:	67.2	65.8	56.7	58.0	66.4	66.5
Vehicle Noise:	74.4	72.7	69.5	64.9	73.4	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	181	391	842
CNEL:	90	195	419	903

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | *Project Name:* Rancho Palma
Road Name: Belmont Av. | *Job Number:* 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	260	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-5.25	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-22.49	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.44	3.57	-1.20	*-5.77*	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:	55.8	53.9	52.1	46.1	54.7	55.3
Medium Trucks:	50.7	49.2	42.8	41.3	49.7	50.0
Heavy Trucks:	53.9	52.5	43.4	44.7	53.0	53.2
Vehicle Noise:	58.7	57.0	53.1	49.2	57.7	58.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	5	10	21	46
CNEL:	5	10	22	48

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | *Project Name:* Rancho Palma
Road Name: Belmont Av. | *Job Number:* 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	250	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-5.42	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-22.66	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.61	3.57	-1.20	*-5.77*	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:	55.6	53.7	52.0	45.9	54.5	55.1
Medium Trucks:	50.5	49.0	42.6	41.1	49.6	49.8
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	58.5	56.9	52.9	49.0	57.5	57.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	4	10	21	44
CNEL:	5	10	22	47

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | *Project Name:* Rancho Palma
Road Name: Belmont Av. | *Job Number:* 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	140	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-7.94	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-25.18	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-29.13	3.57	-1.20	*-5.77*	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:	53.1	51.2	49.4	43.4	52.0	52.6
Medium Trucks:	48.0	46.5	40.1	38.6	47.0	47.3
Heavy Trucks:	51.2	49.8	40.8	42.0	50.4	50.5
Vehicle Noise:	56.0	54.3	50.4	46.5	55.0	55.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	3	6	14	30
CNEL:	3	7	15	32

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | *Project Name:* Rancho Palma
Road Name: Irvington Av. | *Job Number:* 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	400	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-3.38	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-20.62	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-24.57	3.57	-1.20	*-5.77*	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:	57.7	55.8	54.0	47.9	56.6	57.2
Medium Trucks:	52.6	51.1	44.7	43.1	51.6	51.8
Heavy Trucks:	55.8	54.4	45.3	46.6	54.9	55.0
Vehicle Noise:	60.6	58.9	55.0	51.1	59.6	60.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	13	28	61
CNEL:	6	14	30	64

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	360 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.84	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.07	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.03	3.57	-1.20	-5.77	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:	57.2	55.3	53.5	47.5	56.1	56.7
Medium Trucks:	52.1	50.6	44.2	42.7	51.1	51.4
Heavy Trucks:	55.3	53.9	44.9	46.1	54.5	54.6
Vehicle Noise:	60.1	58.4	54.5	50.6	59.1	59.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	26	57
CNEL:	6	13	28	60

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Magnolia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	260 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.25	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.49	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.44	3.57	-1.20	-5.77	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:	55.8	53.9	52.1	46.1	54.7	55.3
Medium Trucks:	50.7	49.2	42.8	41.3	49.7	50.0
Heavy Trucks:	53.9	52.5	43.4	44.7	53.0	53.2
Vehicle Noise:	58.7	57.0	53.1	49.2	57.7	58.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	21	46
CNEL:	5	10	22	48

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	930 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.27	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.50	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.46	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.6	56.6	65.2	65.8
Medium Trucks:	60.1	58.5	52.2	50.6	59.1	59.3
Heavy Trucks:	60.9	59.5	50.4	51.7	60.0	60.2
Vehicle Noise:	68.1	66.4	63.2	58.5	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	131	281
CNEL:	30	65	140	302

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	780 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.03	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.27	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.22	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.5	63.6	61.8	55.8	64.4	65.0
Medium Trucks:	59.3	57.8	51.4	49.9	58.3	58.6
Heavy Trucks:	60.1	58.7	49.7	50.9	59.3	59.4
Vehicle Noise:	67.4	65.6	62.5	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	54	116	250
CNEL:	27	58	125	268

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018
Road Name: W. Little League Dr.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.04	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-24.28	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-28.23	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.7	61.8	60.1	54.0	62.6	63.2
Medium Trucks:	57.6	56.0	49.7	48.1	56.6	56.8
Heavy Trucks:	58.4	57.0	47.9	49.2	57.5	57.7
Vehicle Noise:	65.6	63.8	60.7	56.0	64.6	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	28	60	130
CNEL:	14	30	65	140

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018
Road Name: Kendall Dr.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,680 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.30	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.94	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.89	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.0	65.2	59.1	67.8	68.4
Medium Trucks:	62.6	61.1	54.8	53.2	61.7	61.9
Heavy Trucks:	63.5	62.1	53.0	54.3	62.6	62.8
Vehicle Noise:	70.7	69.0	65.8	61.1	69.7	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	103	221	476
CNEL:	51	110	237	511

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018
Road Name: Kendall Dr.
Road Segment: w/o Pine Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,520 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.13	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.37	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.33	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	66.5	64.8	58.7	67.3	67.9
Medium Trucks:	62.2	60.7	54.3	52.8	61.3	61.5
Heavy Trucks:	63.1	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	70.3	68.5	65.4	60.7	69.2	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	96	207	445
CNEL:	48	103	222	478

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018
Road Name: Kendall Dr.
Road Segment: w/o Campus Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,100 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.27	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.97	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.92	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.8	67.9	66.2	60.1	68.7	69.3
Medium Trucks:	63.6	62.1	55.7	54.2	62.7	62.9
Heavy Trucks:	64.5	63.0	54.0	55.3	63.6	63.7
Vehicle Noise:	71.7	69.9	66.8	62.1	70.6	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	119	256	552
CNEL:	59	128	275	593

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | *Project Name:* Rancho Palma
Road Name: Kendall Dr. | *Job Number:* 9785
Road Segment: w/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,050	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.17	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.07	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.03	1.33	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.7	67.8	66.1	60.0	68.6	69.2
Medium Trucks:	63.5	62.0	55.6	54.1	62.6	62.8
Heavy Trucks:	64.4	62.9	53.9	55.1	63.5	63.6
Vehicle Noise:	71.6	69.8	66.7	62.0	70.5	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	54	117	252	544
CNEL:	58	126	271	583

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | *Project Name:* Rancho Palma
Road Name: Kendall Dr. | *Job Number:* 9785
Road Segment: e/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,900	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.84	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.40	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.36	1.33	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.4	67.5	65.7	59.7	68.3	68.9
Medium Trucks:	63.2	61.7	55.3	53.8	62.2	62.5
Heavy Trucks:	64.0	62.6	53.6	54.8	63.2	63.3
Vehicle Noise:	71.2	69.5	66.3	61.7	70.2	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	52	111	240	517
CNEL:	55	119	257	554

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | *Project Name:* Rancho Palma
Road Name: I-215 Fwy. | *Job Number:* 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,930	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.77	1.77	0.27	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	85.95	-12.10	0.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	88.97	-10.49	0.29	-1.20	*-5.32*	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:	76.6	74.7	72.9	66.9	75.5	76.1
Medium Trucks:	73.0	71.4	65.1	63.5	72.0	72.2
Heavy Trucks:	77.6	76.2	67.1	68.4	76.7	76.9
Vehicle Noise:	80.9	79.3	74.5	71.5	79.9	80.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	285	614	1,323	2,849
CNEL:	299	645	1,390	2,994

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2018 | *Project Name:* Rancho Palma
Road Name: I-215 Fwy. | *Job Number:* 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	46,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,680	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.77	2.53	0.27	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	85.95	-11.34	0.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	88.97	-9.73	0.29	-1.20	*-5.32*	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:	77.4	75.5	73.7	67.7	76.3	76.9
Medium Trucks:	73.7	72.2	65.8	64.3	72.8	73.0
Heavy Trucks:	78.3	76.9	67.9	69.1	77.5	77.6
Vehicle Noise:	81.7	80.0	75.2	72.2	80.7	81.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	320	690	1,486	3,201
CNEL:	336	725	1,561	3,364

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: n/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	210	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.64	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.88	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.83	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	54.8	53.1	47.0	55.6	56.2
Medium Trucks:	51.0	49.5	43.1	41.6	50.0	50.3
Heavy Trucks:	52.8	51.4	42.4	43.6	52.0	52.1
Vehicle Noise:	59.0	57.3	53.8	49.4	58.0	58.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	15	32	69
CNEL:	7	16	34	74

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: s/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	250	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.88	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.12	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.07	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.5	55.6	53.8	47.8	56.4	57.0
Medium Trucks:	51.7	50.2	43.9	42.3	50.8	51.0
Heavy Trucks:	53.6	52.2	43.1	44.4	52.7	52.9
Vehicle Noise:	59.7	58.0	54.6	50.2	58.7	59.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	17	36	78
CNEL:	8	18	39	83

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	410	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.27	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-20.51	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-24.46	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.5	53.6	51.9	45.8	54.4	55.0
Medium Trucks:	50.4	48.9	42.5	41.0	49.4	49.7
Heavy Trucks:	53.6	52.2	43.2	44.4	52.8	52.9
Vehicle Noise:	58.4	56.8	52.8	48.9	57.4	57.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	14	30	64
CNEL:	7	15	32	68

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	740	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.26	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.50	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.45	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.3	63.4	61.6	55.6	64.2	64.8
Medium Trucks:	59.1	57.6	51.2	49.6	58.1	58.3
Heavy Trucks:	59.9	58.5	49.4	50.7	59.1	59.2
Vehicle Noise:	67.1	65.4	62.2	57.6	66.1	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	52	112	242
CNEL:	26	56	120	259

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Irvington Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,390	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.52	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.76	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.72	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.1	64.4	58.3	66.9	67.5
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.1
Heavy Trucks:	62.6	61.2	52.2	53.4	61.8	61.9
Vehicle Noise:	69.9	68.1	65.0	60.3	68.8	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	79	171	368
CNEL:	39	85	183	395

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,660	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.25	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.99	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.94	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.8	66.9	65.1	59.1	67.7	68.3
Medium Trucks:	62.6	61.1	54.7	53.2	61.6	61.9
Heavy Trucks:	63.4	62.0	53.0	54.2	62.6	62.7
Vehicle Noise:	70.6	68.9	65.7	61.1	69.6	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	89	192	414
CNEL:	44	96	206	444

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,510	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.05	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.19	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.15	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.6	68.7	66.9	60.9	69.5	70.1
Medium Trucks:	64.4	62.9	56.5	55.0	63.4	63.6
Heavy Trucks:	65.2	63.8	54.8	56.0	64.4	64.5
Vehicle Noise:	72.4	70.7	67.5	62.9	71.4	71.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	253	545
CNEL:	59	126	272	585

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,950	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.95	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.29	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.24	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.8	68.4	69.0
Medium Trucks:	63.3	61.8	55.4	53.9	62.3	62.6
Heavy Trucks:	64.1	62.7	53.7	54.9	63.3	63.4
Vehicle Noise:	71.3	69.6	66.4	61.8	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	46	99	214	461
CNEL:	49	107	230	494

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	960 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.13	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.37	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.32	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.5	62.7	56.7	65.3	65.9
Medium Trucks:	60.2	58.7	52.3	50.8	59.2	59.5
Heavy Trucks:	61.0	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	68.3	66.5	63.4	58.7	67.2	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	62	133	287
CNEL:	31	66	143	308

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Hallmark Pkwy.

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:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.63	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.87	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.82	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.9	62.0	60.2	54.2	62.8	63.4
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	58.5	57.1	48.1	49.3	57.7	57.8
Vehicle Noise:	65.8	64.0	60.9	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	42	91	196
CNEL:	21	45	98	210

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	300 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.18	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-24.42	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.37	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.4	59.5	57.7	51.6	60.3	60.9
Medium Trucks:	55.1	53.6	47.3	45.7	54.2	54.4
Heavy Trucks:	56.0	54.6	45.5	46.8	55.1	55.3
Vehicle Noise:	63.2	61.5	58.3	53.6	62.2	62.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	29	61	132
CNEL:	14	31	66	142

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	440 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-5.52	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-22.75	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.71	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.0	61.1	59.4	53.3	61.9	62.5
Medium Trucks:	56.8	55.3	48.9	47.4	55.9	56.1
Heavy Trucks:	57.6	56.2	47.2	48.4	56.8	56.9
Vehicle Noise:	64.9	63.1	60.0	55.3	63.8	64.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	17	37	79	171
CNEL:	18	39	85	183

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	890	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.46	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.70	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.65	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.2	62.4	56.4	65.0	65.6
Medium Trucks:	59.9	58.4	52.0	50.5	58.9	59.1
Heavy Trucks:	60.7	59.3	50.3	51.5	59.9	60.0
Vehicle Noise:	67.9	66.2	63.0	58.4	66.9	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	59	127	273
CNEL:	29	63	136	293

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Campus Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

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:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.63	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.87	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.82	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.9	62.0	60.2	54.2	62.8	63.4
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	58.5	57.1	48.1	49.3	57.7	57.8
Vehicle Noise:	65.8	64.0	60.9	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	42	91	196
CNEL:	21	45	98	210

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,190	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.09	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.15	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.11	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.6	69.7	68.0	61.9	70.5	71.2
Medium Trucks:	65.4	63.9	57.6	56.0	64.5	64.7
Heavy Trucks:	66.3	64.9	55.8	57.1	65.4	65.6
Vehicle Noise:	73.5	71.8	68.6	63.9	72.5	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	157	339	730
CNEL:	78	169	363	783

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: s/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,020	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.09	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.15	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.10	1.33	-1.20	-5.43	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:	72.7	70.8	69.0	62.9	71.6	72.2
Medium Trucks:	66.4	64.9	58.6	57.0	65.5	65.7
Heavy Trucks:	67.3	65.9	56.8	58.1	66.4	66.6
Vehicle Noise:	74.5	72.8	69.6	64.9	73.5	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	85	183	395	852
CNEL:	91	197	424	914

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	270	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.08	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.32	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.28	3.57	-1.20	-5.77	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:	56.0	54.1	52.3	46.2	54.9	55.5
Medium Trucks:	50.9	49.3	43.0	41.4	49.9	50.1
Heavy Trucks:	54.1	52.6	43.6	44.9	53.2	53.3
Vehicle Noise:	58.9	57.2	53.3	49.4	57.9	58.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	22	47
CNEL:	5	11	23	50

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	260	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.25	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.49	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.44	3.57	-1.20	-5.77	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:	55.8	53.9	52.1	46.1	54.7	55.3
Medium Trucks:	50.7	49.2	42.8	41.3	49.7	50.0
Heavy Trucks:	53.9	52.5	43.4	44.7	53.0	53.2
Vehicle Noise:	58.7	57.0	53.1	49.2	57.7	58.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	21	46
CNEL:	5	10	22	48

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	140	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.94	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-25.18	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-29.13	3.57	-1.20	-5.77	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:	53.1	51.2	49.4	43.4	52.0	52.6
Medium Trucks:	48.0	46.5	40.1	38.6	47.0	47.3
Heavy Trucks:	51.2	49.8	40.8	42.0	50.4	50.5
Vehicle Noise:	56.0	54.3	50.4	46.5	55.0	55.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	3	6	14	30
CNEL:	3	7	15	32

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	400	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.38	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.62	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.57	3.57	-1.20	-5.77	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:	57.7	55.8	54.0	47.9	56.6	57.2
Medium Trucks:	52.6	51.1	44.7	43.1	51.6	51.8
Heavy Trucks:	55.8	54.4	45.3	46.6	54.9	55.0
Vehicle Noise:	60.6	58.9	55.0	51.1	59.6	60.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	61
CNEL:	6	14	30	64

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | *Project Name:* Rancho Palma
Road Name: Irvington Av. | *Job Number:* 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	370	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-3.72	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-20.95	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-24.91	3.57	-1.20	*-5.77*	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:	57.3	55.4	53.7	47.6	56.2	56.8
Medium Trucks:	52.2	50.7	44.4	42.8	51.3	51.5
Heavy Trucks:	55.4	54.0	45.0	46.2	54.6	54.7
Vehicle Noise:	60.2	58.6	54.6	50.7	59.2	59.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	12	27	58
CNEL:	6	13	28	61

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | *Project Name:* Rancho Palma
Road Name: W. Little League Dr. | *Job Number:* 9785
Road Segment: w/o Magnolia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	240	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-5.60	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-22.83	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.79	3.57	-1.20	*-5.77*	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:	55.4	53.5	51.8	45.7	54.3	55.0
Medium Trucks:	50.3	48.8	42.5	40.9	49.4	49.6
Heavy Trucks:	53.6	52.1	43.1	44.3	52.7	52.8
Vehicle Noise:	58.4	56.7	52.8	48.9	57.4	57.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	4	9	20	43
CNEL:	5	10	21	46

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | *Project Name:* Rancho Palma
Road Name: Kendall Dr. | *Job Number:* 9785
Road Segment: w/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	940	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.22	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-19.46	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.41	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.3	64.4	62.7	56.6	65.2	65.8
Medium Trucks:	60.1	58.6	52.2	50.7	59.1	59.4
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	68.2	66.4	63.3	58.6	67.1	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	28	61	132	283
CNEL:	30	65	141	304

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | *Project Name:* Rancho Palma
Road Name: Kendall Dr. | *Job Number:* 9785
Road Segment: e/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	780	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.03	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-20.27	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-24.22	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.5	63.6	61.8	55.8	64.4	65.0
Medium Trucks:	59.3	57.8	51.4	49.9	58.3	58.6
Heavy Trucks:	60.1	58.7	49.7	50.9	59.3	59.4
Vehicle Noise:	67.4	65.6	62.5	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	25	54	116	250
CNEL:	27	58	125	268

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	230	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-8.33	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-25.57	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-29.53	3.57	-1.20	-5.77	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:	62.4	60.5	58.8	52.7	61.3	61.9
Medium Trucks:	56.3	54.7	48.4	46.8	55.3	55.5
Heavy Trucks:	57.1	55.7	46.6	47.9	56.2	56.4
Vehicle Noise:	64.3	62.6	59.4	54.7	63.3	63.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	11	23	50	107
CNEL:	11	25	53	114

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o Palm Av.

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:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.33	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.91	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.87	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.0	65.2	59.2	67.8	68.4
Medium Trucks:	62.7	61.2	54.8	53.3	61.7	62.0
Heavy Trucks:	63.5	62.1	53.1	54.3	62.7	62.8
Vehicle Noise:	70.7	69.0	65.8	61.2	69.7	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	103	222	478
CNEL:	51	110	238	513

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,530	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.10	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.34	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.30	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.5	66.6	64.8	58.7	67.4	68.0
Medium Trucks:	62.2	60.7	54.4	52.8	61.3	61.5
Heavy Trucks:	63.1	61.7	52.6	53.9	62.2	62.4
Vehicle Noise:	70.3	68.6	65.4	60.7	69.3	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	96	208	447
CNEL:	48	103	223	480

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Campus Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,130	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.33	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.91	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.86	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.9	68.0	66.2	60.2	68.8	69.4
Medium Trucks:	63.7	62.2	55.8	54.3	62.7	63.0
Heavy Trucks:	64.5	63.1	54.1	55.3	63.7	63.8
Vehicle Noise:	71.7	70.0	66.8	62.2	70.7	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	120	259	558
CNEL:	60	129	278	598

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019
Road Name: Kendall Dr.
Road Segment: w/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,080 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.23	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.01	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.96	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.8	67.9	66.1	60.1	68.7	69.3
Medium Trucks:	63.6	62.1	55.7	54.2	62.6	62.9
Heavy Trucks:	64.4	63.0	54.0	55.2	63.6	63.7
Vehicle Noise:	71.6	69.9	66.7	62.1	70.6	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	255	549
CNEL:	59	127	273	589

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019
Road Name: Kendall Dr.
Road Segment: e/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,940 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.93	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.31	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.27	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.8	68.4	69.0
Medium Trucks:	63.3	61.8	55.4	53.9	62.3	62.6
Heavy Trucks:	64.1	62.7	53.7	54.9	63.3	63.4
Vehicle Noise:	71.3	69.6	66.4	61.8	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	113	243	524
CNEL:	56	121	261	562

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019
Road Name: I-215 Fwy.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,970 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	62.0 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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	1.82	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-12.05	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-10.44	0.29	-1.20	-5.32	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:	76.7	74.8	73.0	66.9	75.6	76.2
Medium Trucks:	73.0	71.5	65.1	63.6	72.0	72.3
Heavy Trucks:	77.6	76.2	67.2	68.4	76.8	76.9
Vehicle Noise:	80.9	79.3	74.5	71.5	80.0	80.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	287	618	1,332	2,869
CNEL:	301	649	1,399	3,014

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2019
Road Name: I-215 Fwy.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	47,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,730 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	62.0 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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	2.58	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-11.29	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-9.68	0.29	-1.20	-5.32	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:	77.4	75.5	73.8	67.7	76.3	76.9
Medium Trucks:	73.8	72.3	65.9	64.3	72.8	73.0
Heavy Trucks:	78.4	77.0	67.9	69.2	77.5	77.7
Vehicle Noise:	81.7	80.1	75.3	72.3	80.7	81.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	322	695	1,496	3,224
CNEL:	339	730	1,572	3,388

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: n/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	230	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.24	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.48	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.44	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.1	55.2	53.5	47.4	56.0	56.6
Medium Trucks:	51.4	49.9	43.5	42.0	50.4	50.7
Heavy Trucks:	53.2	51.8	42.8	44.0	52.4	52.5
Vehicle Noise:	59.4	57.7	54.2	49.8	58.4	58.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	16	34	74
CNEL:	8	17	37	79

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: s/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	320	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-5.81	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-23.05	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-27.00	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.6	56.7	54.9	48.9	57.5	58.1
Medium Trucks:	52.8	51.3	44.9	43.4	51.9	52.1
Heavy Trucks:	54.7	53.3	44.2	45.5	53.8	53.9
Vehicle Noise:	60.8	59.1	55.6	51.3	59.8	60.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	20	43	92
CNEL:	10	21	46	98

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	430	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.06	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-20.30	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-24.26	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.7	53.8	52.1	46.0	54.6	55.3
Medium Trucks:	50.6	49.1	42.7	41.2	49.7	49.9
Heavy Trucks:	53.8	52.4	43.4	44.6	53.0	53.1
Vehicle Noise:	58.6	57.0	53.1	49.1	57.7	58.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	14	31	66
CNEL:	7	15	33	70

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	800	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.92	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.16	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.11	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	63.7	62.0	55.9	64.5	65.1
Medium Trucks:	59.4	57.9	51.5	50.0	58.4	58.7
Heavy Trucks:	60.2	58.8	49.8	51.0	59.4	59.5
Vehicle Noise:	67.5	65.7	62.6	57.9	66.4	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	55	118	255
CNEL:	27	59	127	273

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Irvington Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,470	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.28	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.52	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.47	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.3	66.4	64.6	58.5	67.2	67.8
Medium Trucks:	62.0	60.5	54.2	52.6	61.1	61.3
Heavy Trucks:	62.9	61.5	52.4	53.7	62.0	62.2
Vehicle Noise:	70.1	68.4	65.2	60.5	69.1	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	38	82	177	382
CNEL:	41	88	190	410

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,760	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.50	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.73	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.69	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.0	67.1	65.4	59.3	67.9	68.5
Medium Trucks:	62.8	61.3	55.0	53.4	61.9	62.1
Heavy Trucks:	63.7	62.2	53.2	54.5	62.8	62.9
Vehicle Noise:	70.9	69.1	66.0	61.3	69.9	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	93	200	431
CNEL:	46	99	214	462

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,680	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.33	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-14.91	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.86	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.9	69.0	67.2	61.1	69.8	70.4
Medium Trucks:	64.7	63.1	56.8	55.2	63.7	63.9
Heavy Trucks:	65.5	64.1	55.0	56.3	64.6	64.8
Vehicle Noise:	72.7	71.0	67.8	63.1	71.7	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	57	123	265	570
CNEL:	61	132	284	611

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,050	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.17	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.07	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.03	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	67.8	66.0	60.0	68.6	69.2
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.8
Heavy Trucks:	64.3	62.9	53.9	55.1	63.5	63.6
Vehicle Noise:	71.5	69.8	66.7	62.0	70.5	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	103	221	477
CNEL:	51	110	237	511

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,010 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.91	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.15	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.10	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	64.7	63.0	56.9	65.5	66.1
Medium Trucks:	60.4	58.9	52.5	51.0	59.5	59.7
Heavy Trucks:	61.3	59.8	50.8	52.1	60.4	60.5
Vehicle Noise:	68.5	66.7	63.6	58.9	67.4	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	64	138	297
CNEL:	32	69	148	319

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	560 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.47	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.71	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.66	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.1	62.2	60.4	54.3	63.0	63.6
Medium Trucks:	57.9	56.3	50.0	48.4	56.9	57.1
Heavy Trucks:	58.7	57.3	48.2	49.5	57.8	58.0
Vehicle Noise:	65.9	64.2	61.0	56.3	64.9	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	93	201
CNEL:	22	46	100	215

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	320 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.90	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-24.14	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.09	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.6	59.7	58.0	51.9	60.5	61.1
Medium Trucks:	55.4	53.9	47.6	46.0	54.5	54.7
Heavy Trucks:	56.3	54.8	45.8	47.1	55.4	55.5
Vehicle Noise:	63.5	61.7	58.6	53.9	62.5	62.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	30	64	138
CNEL:	15	32	69	148

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	500 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.96	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-22.20	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.16	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.6	61.7	59.9	53.9	62.5	63.1
Medium Trucks:	57.4	55.9	49.5	47.9	56.4	56.6
Heavy Trucks:	58.2	56.8	47.7	49.0	57.4	57.5
Vehicle Noise:	65.4	63.7	60.5	55.9	64.4	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	40	86	186
CNEL:	20	43	93	200

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	950	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.17	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.41	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.37	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.5	62.7	56.6	65.3	65.9
Medium Trucks:	60.1	58.6	52.3	50.7	59.2	59.4
Heavy Trucks:	61.0	59.6	50.5	51.8	60.1	60.3
Vehicle Noise:	68.2	66.5	63.3	58.6	67.2	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	61	132	285
CNEL:	31	66	142	306

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Campus Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	550	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.55	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.79	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.74	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.0	62.1	60.3	54.3	62.9	63.5
Medium Trucks:	57.8	56.3	49.9	48.4	56.8	57.1
Heavy Trucks:	58.6	57.2	48.2	49.4	57.8	57.9
Vehicle Noise:	65.8	64.1	60.9	56.3	64.8	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	92	198
CNEL:	21	46	99	213

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,210	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.11	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.12	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.08	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.7	69.8	68.0	62.0	70.6	71.2
Medium Trucks:	65.5	64.0	57.6	56.0	64.5	64.7
Heavy Trucks:	66.3	64.9	55.8	57.1	65.5	65.6
Vehicle Noise:	73.5	71.8	68.6	64.0	72.5	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	158	340	733
CNEL:	79	169	365	786

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: s/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,040	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.11	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.13	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.08	1.33	-1.20	-5.43	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:	72.7	70.8	69.0	63.0	71.6	72.2
Medium Trucks:	66.5	65.0	58.6	57.0	65.5	65.7
Heavy Trucks:	67.3	65.9	56.8	58.1	66.5	66.6
Vehicle Noise:	74.5	72.8	69.6	64.9	73.5	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	85	184	397	855
CNEL:	92	197	425	917

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	290	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.77	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.01	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.97	3.57	-1.20	-5.77	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:	56.3	54.4	52.6	46.5	55.2	55.8
Medium Trucks:	51.2	49.7	43.3	41.7	50.2	50.4
Heavy Trucks:	54.4	53.0	43.9	45.2	53.5	53.6
Vehicle Noise:	59.2	57.5	53.6	49.7	58.2	58.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	11	23	49
CNEL:	5	11	24	52

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	290	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.77	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.01	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.97	3.57	-1.20	-5.77	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:	56.3	54.4	52.6	46.5	55.2	55.8
Medium Trucks:	51.2	49.7	43.3	41.7	50.2	50.4
Heavy Trucks:	54.4	53.0	43.9	45.2	53.5	53.6
Vehicle Noise:	59.2	57.5	53.6	49.7	58.2	58.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	11	23	49
CNEL:	5	11	24	52

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	180	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.85	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-24.08	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-28.04	3.57	-1.20	-5.77	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:	54.2	52.3	50.5	44.5	53.1	53.7
Medium Trucks:	49.1	47.6	41.2	39.7	48.1	48.4
Heavy Trucks:	52.3	50.9	41.8	43.1	51.5	51.6
Vehicle Noise:	57.1	55.4	51.5	47.6	56.1	56.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	8	17	36
CNEL:	4	8	18	38

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	420	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.17	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.40	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.36	3.57	-1.20	-5.77	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:	57.9	56.0	54.2	48.2	56.8	57.4
Medium Trucks:	52.8	51.3	44.9	43.4	51.8	52.0
Heavy Trucks:	56.0	54.6	45.5	46.8	55.1	55.3
Vehicle Noise:	60.8	59.1	55.2	51.3	59.8	60.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	29	63
CNEL:	7	14	31	66

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019
Road Name: Irvington Av.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	370	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-3.72	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-20.95	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-24.91	3.57	-1.20	*-5.77*	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:	57.3	55.4	53.7	47.6	56.2	56.8
Medium Trucks:	52.2	50.7	44.4	42.8	51.3	51.5
Heavy Trucks:	55.4	54.0	45.0	46.2	54.6	54.7
Vehicle Noise:	60.2	58.6	54.6	50.7	59.2	59.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	12	27	58
CNEL:	6	13	28	61

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019
Road Name: W. Little League Dr.
Road Segment: w/o Magnolia Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	320	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-4.35	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-21.59	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-25.54	3.57	-1.20	*-5.77*	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:	56.7	54.8	53.0	47.0	55.6	56.2
Medium Trucks:	51.6	50.1	43.7	42.2	50.6	50.9
Heavy Trucks:	54.8	53.4	44.3	45.6	54.0	54.1
Vehicle Noise:	59.6	57.9	54.0	50.1	58.6	59.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	5	11	24	52
CNEL:	6	12	26	55

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019
Road Name: Kendall Dr.
Road Segment: w/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	980	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.04	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-19.28	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.23	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.5	64.6	62.8	56.8	65.4	66.0
Medium Trucks:	60.3	58.8	52.4	50.9	59.3	59.6
Heavy Trucks:	61.1	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	68.3	66.6	63.4	58.8	67.3	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	63	135	291
CNEL:	31	67	145	313

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019
Road Name: Kendall Dr.
Road Segment: e/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	800	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.92	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-20.16	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-24.11	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	62.0	55.9	64.5	65.1
Medium Trucks:	59.4	57.9	51.5	50.0	58.4	58.7
Heavy Trucks:	60.2	58.8	49.8	51.0	59.4	59.5
Vehicle Noise:	67.5	65.7	62.6	57.9	66.4	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	25	55	118	255
CNEL:	27	59	127	273

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	620	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.03	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-21.27	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-25.22	3.57	-1.20	-5.77	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	63.1	57.0	65.6	66.2
Medium Trucks:	60.6	59.1	52.7	51.1	59.6	59.8
Heavy Trucks:	61.4	60.0	50.9	52.2	60.5	60.7
Vehicle Noise:	68.6	66.9	63.7	59.0	67.6	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	45	96	207
CNEL:	22	48	103	222

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,820	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.65	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.59	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.54	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.2	67.3	65.5	59.5	68.1	68.7
Medium Trucks:	63.0	61.5	55.1	53.6	62.0	62.3
Heavy Trucks:	63.8	62.4	53.4	54.6	63.0	63.1
Vehicle Noise:	71.1	69.3	66.2	61.5	70.0	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	108	233	502
CNEL:	54	116	250	539

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,660	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.25	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.99	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.94	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.8	66.9	65.1	59.1	67.7	68.3
Medium Trucks:	62.6	61.1	54.7	53.2	61.6	61.9
Heavy Trucks:	63.4	62.0	53.0	54.2	62.6	62.7
Vehicle Noise:	70.7	68.9	65.8	61.1	69.6	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	102	219	472
CNEL:	51	109	235	507

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Campus Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,200	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.47	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.77	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.72	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.0	68.1	66.4	60.3	68.9	69.5
Medium Trucks:	63.8	62.3	56.0	54.4	62.9	63.1
Heavy Trucks:	64.7	63.2	54.2	55.5	63.8	63.9
Vehicle Noise:	71.9	70.1	67.0	62.3	70.9	71.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	57	123	264	570
CNEL:	61	132	284	611

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,140	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.35	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.89	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.84	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.9	68.0	66.2	60.2	68.8	69.4
Medium Trucks:	63.7	62.2	55.8	54.3	62.7	63.0
Heavy Trucks:	64.5	63.1	54.1	55.3	63.7	63.8
Vehicle Noise:	71.8	70.0	66.9	62.2	70.7	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	260	559
CNEL:	60	129	279	600

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,960	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.97	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.27	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.22	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.9	59.8	68.4	69.0
Medium Trucks:	63.3	61.8	55.4	53.9	62.4	62.6
Heavy Trucks:	64.2	62.7	53.7	55.0	63.3	63.4
Vehicle Noise:	71.4	69.6	66.5	61.8	70.4	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	245	528
CNEL:	57	122	263	566

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: I-215 Fwy. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,030	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	1.88	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-11.99	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-10.38	0.29	-1.20	-5.32	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:	76.7	74.8	73.1	67.0	75.6	76.2
Medium Trucks:	73.1	71.6	65.2	63.7	72.1	72.3
Heavy Trucks:	77.7	76.3	67.2	68.5	76.8	77.0
Vehicle Noise:	81.0	79.4	74.6	71.6	80.0	80.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	290	624	1,345	2,897
CNEL:	304	656	1,413	3,045

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: I-215 Fwy. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	47,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,790	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	2.63	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-11.24	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-9.63	0.29	-1.20	-5.32	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:	77.5	75.6	73.8	67.8	76.4	77.0
Medium Trucks:	73.8	72.3	65.9	64.4	72.9	73.1
Heavy Trucks:	78.4	77.0	68.0	69.2	77.6	77.7
Vehicle Noise:	81.8	80.1	75.3	72.3	80.8	81.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	325	700	1,509	3,251
CNEL:	342	736	1,586	3,416

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: n/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	210	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.64	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.88	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.83	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	54.8	53.1	47.0	55.6	56.2
Medium Trucks:	51.0	49.5	43.1	41.6	50.0	50.3
Heavy Trucks:	52.8	51.4	42.4	43.6	52.0	52.1
Vehicle Noise:	59.0	57.3	53.8	49.4	58.0	58.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	15	32	69
CNEL:	7	16	34	74

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: s/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	250	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.88	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.12	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.07	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.5	55.6	53.8	47.8	56.4	57.0
Medium Trucks:	51.7	50.2	43.9	42.3	50.8	51.0
Heavy Trucks:	53.6	52.2	43.1	44.4	52.7	52.9
Vehicle Noise:	59.7	58.0	54.6	50.2	58.7	59.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	17	36	78
CNEL:	8	18	39	83

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	420	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.17	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-20.40	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-24.36	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.6	53.7	52.0	45.9	54.5	55.2
Medium Trucks:	50.5	49.0	42.6	41.1	49.5	49.8
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	58.5	56.9	53.0	49.0	57.5	57.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	14	30	65
CNEL:	7	15	32	69

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	750	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.20	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.44	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.39	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.3	63.4	61.7	55.6	64.2	64.8
Medium Trucks:	59.1	57.6	51.3	49.7	58.2	58.4
Heavy Trucks:	60.0	58.5	49.5	50.8	59.1	59.2
Vehicle Noise:	67.2	65.4	62.3	57.6	66.2	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	53	113	244
CNEL:	26	56	121	262

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Irvington Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,410 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.46	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.70	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.65	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.1	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	61.9	60.4	54.0	52.4	60.9	61.1
Heavy Trucks:	62.7	61.3	52.2	53.5	61.9	62.0
Vehicle Noise:	69.9	68.2	65.0	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	80	172	371
CNEL:	40	86	185	398

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,680 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.30	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.94	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.89	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.8	66.9	65.2	59.1	67.7	68.3
Medium Trucks:	62.6	61.1	54.8	53.2	61.7	61.9
Heavy Trucks:	63.5	62.0	53.0	54.3	62.6	62.7
Vehicle Noise:	70.7	68.9	65.8	61.1	69.7	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	90	194	417
CNEL:	45	96	208	448

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o I-215 Fwy. NB Ramps

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:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.18	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.06	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.01	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.7	68.8	67.1	61.0	69.6	70.2
Medium Trucks:	64.5	63.0	56.6	55.1	63.6	63.8
Heavy Trucks:	65.3	63.9	54.9	56.1	64.5	64.6
Vehicle Noise:	72.6	70.8	67.7	63.0	71.5	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	120	259	557
CNEL:	60	129	277	597

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,070 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.21	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.03	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.99	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	67.8	66.1	60.0	68.6	69.3
Medium Trucks:	63.5	62.0	55.7	54.1	62.6	62.8
Heavy Trucks:	64.4	63.0	53.9	55.2	63.5	63.6
Vehicle Noise:	71.6	69.8	66.7	62.0	70.6	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	103	223	480
CNEL:	51	111	239	515

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,140 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.38	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.62	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.58	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.3	63.5	57.4	66.1	66.7
Medium Trucks:	60.9	59.4	53.1	51.5	60.0	60.2
Heavy Trucks:	61.8	60.4	51.3	52.6	60.9	61.1
Vehicle Noise:	69.0	67.3	64.1	59.4	68.0	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	69	150	322
CNEL:	35	74	160	346

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	600 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.17	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.41	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.36	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.4	62.5	60.7	54.6	63.3	63.9
Medium Trucks:	58.2	56.6	50.3	48.7	57.2	57.4
Heavy Trucks:	59.0	57.6	48.5	49.8	58.1	58.3
Vehicle Noise:	66.2	64.5	61.3	56.6	65.2	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	45	98	210
CNEL:	23	49	105	225

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.04	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-24.28	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.23	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.5	59.6	57.8	51.8	60.4	61.0
Medium Trucks:	55.3	53.8	47.4	45.9	54.3	54.6
Heavy Trucks:	56.1	54.7	45.7	46.9	55.3	55.4
Vehicle Noise:	63.3	61.6	58.4	53.8	62.3	62.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	29	63	135
CNEL:	15	31	67	145

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	480 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-5.14	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-22.38	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.33	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.4	61.5	59.7	53.7	62.3	62.9
Medium Trucks:	57.2	55.7	49.3	47.8	56.2	56.5
Heavy Trucks:	58.0	56.6	47.6	48.8	57.2	57.3
Vehicle Noise:	65.2	63.5	60.3	55.7	64.2	64.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	84	181
CNEL:	19	42	90	194

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018
Road Name: Pine Av.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	930 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.27	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.50	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.46	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.6	56.6	65.2	65.8
Medium Trucks:	60.1	58.5	52.2	50.6	59.1	59.3
Heavy Trucks:	60.9	59.5	50.4	51.7	60.0	60.2
Vehicle Noise:	68.1	66.4	63.2	58.5	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	131	281
CNEL:	30	65	140	302

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018
Road Name: Campus Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	570 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.39	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.63	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.59	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.1	62.2	60.5	54.4	63.0	63.7
Medium Trucks:	57.9	56.4	50.1	48.5	57.0	57.2
Heavy Trucks:	58.8	57.4	48.3	49.6	57.9	58.0
Vehicle Noise:	66.0	64.2	61.1	56.4	65.0	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	44	94	203
CNEL:	22	47	101	218

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018
Road Name: University Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,230 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.14	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.10	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.05	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.7	69.8	68.0	62.0	70.6	71.2
Medium Trucks:	65.5	64.0	57.6	56.1	64.5	64.8
Heavy Trucks:	66.3	64.9	55.9	57.1	65.5	65.6
Vehicle Noise:	73.5	71.8	68.6	64.0	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	74	159	342	736
CNEL:	79	170	366	790

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018
Road Name: University Pkwy.
Road Segment: s/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,100 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.18	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.06	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.02	1.33	-1.20	-5.43	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:	72.7	70.8	69.1	63.0	71.6	72.2
Medium Trucks:	66.5	65.0	58.7	57.1	65.6	65.8
Heavy Trucks:	67.4	65.9	56.9	58.2	66.5	66.6
Vehicle Noise:	74.6	72.8	69.7	65.0	73.6	74.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	86	186	401	863
CNEL:	93	199	430	926

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	270	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.08	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.32	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.28	3.57	-1.20	-5.77	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:	56.0	54.1	52.3	46.2	54.9	55.5
Medium Trucks:	50.9	49.3	43.0	41.4	49.9	50.1
Heavy Trucks:	54.1	52.6	43.6	44.9	53.2	53.3
Vehicle Noise:	58.9	57.2	53.3	49.4	57.9	58.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	22	47
CNEL:	5	11	23	50

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	260	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.25	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.49	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.44	3.57	-1.20	-5.77	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:	55.8	53.9	52.1	46.1	54.7	55.3
Medium Trucks:	50.7	49.2	42.8	41.3	49.7	50.0
Heavy Trucks:	53.9	52.5	43.4	44.7	53.0	53.2
Vehicle Noise:	58.7	57.0	53.1	49.2	57.7	58.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	21	46
CNEL:	5	10	22	48

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	140	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.94	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-25.18	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-29.13	3.57	-1.20	-5.77	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:	53.1	51.2	49.4	43.4	52.0	52.6
Medium Trucks:	48.0	46.5	40.1	38.6	47.0	47.3
Heavy Trucks:	51.2	49.8	40.8	42.0	50.4	50.5
Vehicle Noise:	56.0	54.3	50.4	46.5	55.0	55.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	3	6	14	30
CNEL:	3	7	15	32

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	400	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.38	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.62	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.57	3.57	-1.20	-5.77	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:	57.7	55.8	54.0	47.9	56.6	57.2
Medium Trucks:	52.6	51.1	44.7	43.1	51.6	51.8
Heavy Trucks:	55.8	54.4	45.3	46.6	54.9	55.0
Vehicle Noise:	60.6	58.9	55.0	51.1	59.6	60.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	61
CNEL:	6	14	30	64

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018
Road Name: Irvington Av.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	370 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.72	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.95	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.91	3.57	-1.20	-5.77	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:	57.3	55.4	53.7	47.6	56.2	56.8
Medium Trucks:	52.2	50.7	44.4	42.8	51.3	51.5
Heavy Trucks:	55.4	54.0	45.0	46.2	54.6	54.7
Vehicle Noise:	60.2	58.6	54.6	50.7	59.2	59.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	27	58
CNEL:	6	13	28	61

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018
Road Name: W. Little League Dr.
Road Segment: w/o Magnolia Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	240 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.60	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.83	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.79	3.57	-1.20	-5.77	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:	55.4	53.5	51.8	45.7	54.3	55.0
Medium Trucks:	50.3	48.8	42.5	40.9	49.4	49.6
Heavy Trucks:	53.6	52.1	43.1	44.3	52.7	52.8
Vehicle Noise:	58.4	56.7	52.8	48.9	57.4	57.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	9	20	43
CNEL:	5	10	21	46

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018
Road Name: Kendall Dr.
Road Segment: w/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	930 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.27	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.50	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.46	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.6	56.6	65.2	65.8
Medium Trucks:	60.1	58.5	52.2	50.6	59.1	59.3
Heavy Trucks:	60.9	59.5	50.4	51.7	60.0	60.2
Vehicle Noise:	68.1	66.4	63.2	58.5	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	131	281
CNEL:	30	65	140	302

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018
Road Name: Kendall Dr.
Road Segment: e/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	760 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.14	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.38	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.34	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.4	63.5	61.7	55.7	64.3	64.9
Medium Trucks:	59.2	57.7	51.3	49.8	58.2	58.5
Heavy Trucks:	60.0	58.6	49.6	50.8	59.2	59.3
Vehicle Noise:	67.2	65.5	62.3	57.7	66.2	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	114	246
CNEL:	26	57	122	264

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	230 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-8.33	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-25.57	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-29.53	3.57	-1.20	-5.77	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:	62.4	60.5	58.8	52.7	61.3	61.9
Medium Trucks:	56.3	54.7	48.4	46.8	55.3	55.5
Heavy Trucks:	57.1	55.7	46.6	47.9	56.2	56.4
Vehicle Noise:	64.3	62.6	59.4	54.7	63.3	63.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	11	23	50	107
CNEL:	11	25	53	114

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,780 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.55	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.69	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.64	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	67.2	65.4	59.4	68.0	68.6
Medium Trucks:	62.9	61.4	55.0	53.5	61.9	62.2
Heavy Trucks:	63.7	62.3	53.3	54.5	62.9	63.0
Vehicle Noise:	71.0	69.2	66.1	61.4	69.9	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	49	107	230	495
CNEL:	53	114	246	531

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,600 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.09	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.15	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.10	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.7	66.8	65.0	58.9	67.6	68.2
Medium Trucks:	62.4	60.9	54.6	53.0	61.5	61.7
Heavy Trucks:	63.3	61.9	52.8	54.1	62.4	62.6
Vehicle Noise:	70.5	68.8	65.6	60.9	69.5	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	46	99	214	461
CNEL:	49	106	229	494

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Campus Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,190 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.45	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.78	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.74	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.0	68.1	66.3	60.3	68.9	69.5
Medium Trucks:	63.8	62.3	55.9	54.4	62.8	63.1
Heavy Trucks:	64.6	63.2	54.2	55.4	63.8	63.9
Vehicle Noise:	71.9	70.1	67.0	62.3	70.8	71.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	57	122	264	568
CNEL:	61	131	283	609

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,150 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.37	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.86	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.82	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.9	68.0	66.3	60.2	68.8	69.4
Medium Trucks:	63.7	62.2	55.9	54.3	62.8	63.0
Heavy Trucks:	64.6	63.1	54.1	55.4	63.7	63.8
Vehicle Noise:	71.8	70.0	66.9	62.2	70.8	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	260	561
CNEL:	60	130	279	602

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,950 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.95	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.29	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.24	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.8	68.4	69.0
Medium Trucks:	63.3	61.8	55.4	53.9	62.3	62.6
Heavy Trucks:	64.1	62.7	53.7	54.9	63.3	63.4
Vehicle Noise:	71.4	69.6	66.5	61.8	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	113	244	526
CNEL:	56	122	262	564

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: I-215 Fwy. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,980 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	62.0 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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	1.83	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-12.04	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-10.43	0.29	-1.20	-5.32	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:	76.7	74.8	73.0	66.9	75.6	76.2
Medium Trucks:	73.0	71.5	65.1	63.6	72.1	72.3
Heavy Trucks:	77.6	76.2	67.2	68.4	76.8	76.9
Vehicle Noise:	80.9	79.3	74.5	71.5	80.0	80.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	287	619	1,334	2,873
CNEL:	302	650	1,401	3,019

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 | Project Name: Rancho Palma
Road Name: I-215 Fwy. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	46,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,690 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	62.0 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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	2.54	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-11.33	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-9.72	0.29	-1.20	-5.32	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:	77.4	75.5	73.7	67.7	76.3	76.9
Medium Trucks:	73.7	72.2	65.9	64.3	72.8	73.0
Heavy Trucks:	78.3	76.9	67.9	69.1	77.5	77.6
Vehicle Noise:	81.7	80.1	75.3	72.2	80.7	81.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	321	691	1,488	3,206
CNEL:	337	726	1,564	3,368

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: N. Little League Dr.
Road Segment: n/o W. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	210 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.64	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.88	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.83	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	54.8	53.1	47.0	55.6	56.2
Medium Trucks:	51.0	49.5	43.1	41.6	50.0	50.3
Heavy Trucks:	52.8	51.4	42.4	43.6	52.0	52.1
Vehicle Noise:	59.0	57.3	53.8	49.4	58.0	58.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	15	32	69
CNEL:	7	16	34	74

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: N. Little League Dr.
Road Segment: s/o W. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	270 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.55	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-23.78	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-27.74	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.8	55.9	54.2	48.1	56.7	57.3
Medium Trucks:	52.1	50.6	44.2	42.7	51.1	51.4
Heavy Trucks:	53.9	52.5	43.5	44.7	53.1	53.2
Vehicle Noise:	60.1	58.4	54.9	50.5	59.1	59.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	18	38	82
CNEL:	9	19	41	88

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Palm Av.
Road Segment: n/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	420 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.17	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-20.40	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-24.36	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.6	53.7	52.0	45.9	54.5	55.2
Medium Trucks:	50.5	49.0	42.6	41.1	49.5	49.8
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	58.5	56.9	53.0	49.0	57.5	57.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	14	30	65
CNEL:	7	15	32	69

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Palm Av.
Road Segment: s/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	760 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.14	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.38	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.34	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.4	63.5	61.7	55.7	64.3	64.9
Medium Trucks:	59.2	57.7	51.3	49.8	58.2	58.5
Heavy Trucks:	60.0	58.6	49.6	50.8	59.2	59.3
Vehicle Noise:	67.2	65.5	62.3	57.7	66.2	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	114	246
CNEL:	26	57	122	264

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Palm Av.
Road Segment: s/o Irvington Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,410 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.46	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.70	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.65	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.1	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	61.9	60.4	54.0	52.4	60.9	61.1
Heavy Trucks:	62.7	61.3	52.2	53.5	61.9	62.0
Vehicle Noise:	69.9	68.2	65.0	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	80	172	371
CNEL:	40	86	185	398

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Palm Av.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

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:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.33	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.91	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.87	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.0	65.2	59.1	67.8	68.4
Medium Trucks:	62.7	61.1	54.8	53.2	61.7	61.9
Heavy Trucks:	63.5	62.1	53.0	54.3	62.6	62.8
Vehicle Noise:	70.7	69.0	65.8	61.1	69.7	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	90	195	419
CNEL:	45	97	209	449

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Palm Av.
Road Segment: n/o I-215 Fwy. NB Ramps
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,660 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.30	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-14.94	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.90	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.8	68.9	67.2	61.1	69.7	70.3
Medium Trucks:	64.6	63.1	56.8	55.2	63.7	63.9
Heavy Trucks:	65.5	64.0	55.0	56.3	64.6	64.7
Vehicle Noise:	72.7	70.9	67.8	63.1	71.7	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	57	122	263	567
CNEL:	61	131	282	608

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Palm Av.
Road Segment: s/o I-215 Fwy. NB Ramps
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,110 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.29	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.95	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.90	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.8	67.9	66.2	60.1	68.7	69.3
Medium Trucks:	63.6	62.1	55.7	54.2	62.7	62.9
Heavy Trucks:	64.5	63.0	54.0	55.2	63.6	63.7
Vehicle Noise:	71.7	69.9	66.8	62.1	70.6	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	49	105	226	486
CNEL:	52	112	242	521

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Palm Av.
Road Segment: n/o Hallmark Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,150	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.34	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.58	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.54	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.3	63.5	57.5	66.1	66.7
Medium Trucks:	61.0	59.5	53.1	51.6	60.0	60.3
Heavy Trucks:	61.8	60.4	51.4	52.6	61.0	61.1
Vehicle Noise:	69.0	67.3	64.1	59.5	68.0	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	70	150	324
CNEL:	35	75	161	348

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Palm Av.
Road Segment: s/o Hallmark Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	610	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.10	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.34	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.29	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.4	62.5	60.8	54.7	63.3	63.9
Medium Trucks:	58.2	56.7	50.4	48.8	57.3	57.5
Heavy Trucks:	59.1	57.6	48.6	49.9	58.2	58.3
Vehicle Noise:	66.3	64.5	61.4	56.7	65.3	65.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	46	99	212
CNEL:	23	49	106	228

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Pine Av.
Road Segment: n/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	310	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.04	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-24.28	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.23	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.5	59.6	57.8	51.8	60.4	61.0
Medium Trucks:	55.3	53.8	47.4	45.9	54.3	54.6
Heavy Trucks:	56.1	54.7	45.7	46.9	55.3	55.4
Vehicle Noise:	63.3	61.6	58.4	53.8	62.3	62.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	29	63	135
CNEL:	15	31	67	145

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Pine Av.
Road Segment: s/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	480	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-5.14	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-22.38	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.33	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.4	61.5	59.7	53.7	62.3	62.9
Medium Trucks:	57.2	55.7	49.3	47.8	56.2	56.5
Heavy Trucks:	58.0	56.6	47.6	48.8	57.2	57.3
Vehicle Noise:	65.2	63.5	60.3	55.7	64.2	64.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	84	181
CNEL:	19	42	90	194

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Pine Av.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	930	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.27	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-19.50	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.46	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.6	56.6	65.2	65.8
Medium Trucks:	60.1	58.5	52.2	50.6	59.1	59.3
Heavy Trucks:	60.9	59.5	50.4	51.7	60.0	60.2
Vehicle Noise:	68.1	66.4	63.2	58.5	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	131	281
CNEL:	30	65	140	302

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Campus Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	580	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.32	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-21.56	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-25.51	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	62.3	60.6	54.5	63.1	63.7
Medium Trucks:	58.0	56.5	50.1	48.6	57.1	57.3
Heavy Trucks:	58.8	57.4	48.4	49.6	58.0	58.1
Vehicle Noise:	66.1	64.3	61.2	56.5	65.0	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	44	95	205
CNEL:	22	47	102	220

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: University Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,230	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.14	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-14.10	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-18.05	1.33	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.7	69.8	68.0	62.0	70.6	71.2
Medium Trucks:	65.5	64.0	57.6	56.1	64.5	64.8
Heavy Trucks:	66.3	64.9	55.9	57.1	65.5	65.6
Vehicle Noise:	73.5	71.8	68.6	64.0	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	74	159	342	736
CNEL:	79	170	366	790

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: University Pkwy.
Road Segment: s/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,110	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.19	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-13.05	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-17.01	1.33	-1.20	*-5.43*	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:	72.7	70.8	69.1	63.0	71.7	72.3
Medium Trucks:	66.5	65.0	58.7	57.1	65.6	65.8
Heavy Trucks:	67.4	66.0	56.9	58.2	66.5	66.7
Vehicle Noise:	74.6	72.9	69.7	65.0	73.6	74.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	86	186	401	864
CNEL:	93	200	430	927

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	270	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.08	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.32	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.28	3.57	-1.20	-5.77	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:	56.0	54.1	52.3	46.2	54.9	55.5
Medium Trucks:	50.9	49.3	43.0	41.4	49.9	50.1
Heavy Trucks:	54.1	52.6	43.6	44.9	53.2	53.3
Vehicle Noise:	58.9	57.2	53.3	49.4	57.9	58.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	22	47
CNEL:	5	11	23	50

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	260	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.25	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.49	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.44	3.57	-1.20	-5.77	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:	55.8	53.9	52.1	46.1	54.7	55.3
Medium Trucks:	50.7	49.2	42.8	41.3	49.7	50.0
Heavy Trucks:	53.9	52.5	43.4	44.7	53.0	53.2
Vehicle Noise:	58.7	57.0	53.1	49.2	57.7	58.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	21	46
CNEL:	5	10	22	48

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	140	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.94	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-25.18	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-29.13	3.57	-1.20	-5.77	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:	53.1	51.2	49.4	43.4	52.0	52.6
Medium Trucks:	48.0	46.5	40.1	38.6	47.0	47.3
Heavy Trucks:	51.2	49.8	40.8	42.0	50.4	50.5
Vehicle Noise:	56.0	54.3	50.4	46.5	55.0	55.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	3	6	14	30
CNEL:	3	7	15	32

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	400	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.38	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.62	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.57	3.57	-1.20	-5.77	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:	57.7	55.8	54.0	47.9	56.6	57.2
Medium Trucks:	52.6	51.1	44.7	43.1	51.6	51.8
Heavy Trucks:	55.8	54.4	45.3	46.6	54.9	55.0
Vehicle Noise:	60.6	58.9	55.0	51.1	59.6	60.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	61
CNEL:	6	14	30	64

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Irvington Av.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	370 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.72	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.95	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.91	3.57	-1.20	-5.77	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:	57.3	55.4	53.7	47.6	56.2	56.8
Medium Trucks:	52.2	50.7	44.4	42.8	51.3	51.5
Heavy Trucks:	55.4	54.0	45.0	46.2	54.6	54.7
Vehicle Noise:	60.2	58.6	54.6	50.7	59.2	59.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	27	58
CNEL:	6	13	28	61

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: W. Little League Dr.
Road Segment: w/o Magnolia Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	270 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.08	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.32	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.28	3.57	-1.20	-5.77	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:	56.0	54.1	52.3	46.2	54.9	55.5
Medium Trucks:	50.9	49.3	43.0	41.4	49.9	50.1
Heavy Trucks:	54.1	52.6	43.6	44.9	53.2	53.3
Vehicle Noise:	58.9	57.2	53.3	49.4	57.9	58.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	22	47
CNEL:	5	11	23	50

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Kendall Dr.
Road Segment: w/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	930 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.27	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.50	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.46	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.6	56.6	65.2	65.8
Medium Trucks:	60.1	58.5	52.2	50.6	59.1	59.3
Heavy Trucks:	60.9	59.5	50.4	51.7	60.0	60.2
Vehicle Noise:	68.1	66.4	63.2	58.5	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	131	281
CNEL:	30	65	140	302

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Kendall Dr.
Road Segment: e/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	780 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.03	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.27	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.22	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.5	63.6	61.8	55.8	64.4	65.0
Medium Trucks:	59.3	57.8	51.4	49.9	58.3	58.6
Heavy Trucks:	60.1	58.7	49.7	50.9	59.3	59.4
Vehicle Noise:	67.4	65.6	62.5	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	54	116	250
CNEL:	27	58	125	268

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: W. Little League Dr.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	320	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.90	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-24.14	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-28.09	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.9	62.0	60.2	54.1	62.8	63.4
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	58.5	57.1	48.1	49.3	57.7	57.8
Vehicle Noise:	65.7	64.0	60.8	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	29	62	133
CNEL:	14	31	66	143

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Kendall Dr.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,800	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.60	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.64	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.59	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.2	67.3	65.5	59.4	68.1	68.7
Medium Trucks:	62.9	61.4	55.1	53.5	62.0	62.2
Heavy Trucks:	63.8	62.4	53.3	54.6	62.9	63.1
Vehicle Noise:	71.0	69.3	66.1	61.4	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	107	231	498
CNEL:	53	115	248	535

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Kendall Dr.
Road Segment: w/o Pine Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,610	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.12	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.12	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.08	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.7	66.8	65.0	59.0	67.6	68.2
Medium Trucks:	62.5	61.0	54.6	53.0	61.5	61.7
Heavy Trucks:	63.3	61.9	52.8	54.1	62.5	62.6
Vehicle Noise:	70.5	68.8	65.6	61.0	69.5	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	46	100	215	463
CNEL:	50	107	230	496

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Kendall Dr.
Road Segment: w/o Campus Pkwy.
Project Name: Rancho Palma
Job Number: 9785

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:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.49	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.75	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.70	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.1	68.2	66.4	60.3	69.0	69.6
Medium Trucks:	63.8	62.3	56.0	54.4	62.9	63.1
Heavy Trucks:	64.7	63.3	54.2	55.5	63.8	64.0
Vehicle Noise:	71.9	70.2	67.0	62.3	70.9	71.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	57	123	265	572
CNEL:	61	132	285	613

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Kendall Dr.
Road Segment: w/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,160 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.39	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.84	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.80	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.0	68.1	66.3	60.2	68.9	69.5
Medium Trucks:	63.7	62.2	55.9	54.3	62.8	63.0
Heavy Trucks:	64.6	63.2	54.1	55.4	63.7	63.9
Vehicle Noise:	71.8	70.1	66.9	62.2	70.8	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	261	563
CNEL:	60	130	280	604

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: Kendall Dr.
Road Segment: e/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.06	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.18	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.13	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	66.0	59.9	68.5	69.1
Medium Trucks:	63.4	61.9	55.5	54.0	62.5	62.7
Heavy Trucks:	64.2	62.8	53.8	55.0	63.4	63.5
Vehicle Noise:	71.5	69.7	66.6	61.9	70.4	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	115	248	535
CNEL:	57	124	266	574

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: I-215 Fwy.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,010 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	62.0 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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	1.86	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-12.01	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-10.40	0.29	-1.20	-5.32	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:	76.7	74.8	73.0	67.0	75.6	76.2
Medium Trucks:	73.0	71.5	65.2	63.6	72.1	72.3
Heavy Trucks:	77.7	76.2	67.2	68.5	76.8	76.9
Vehicle Noise:	81.0	79.4	74.6	71.6	80.0	80.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	289	622	1,340	2,888
CNEL:	303	654	1,408	3,034

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2018 With Project
Road Name: I-215 Fwy.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	47,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,720 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	62.0 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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	2.57	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-11.30	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-9.69	0.29	-1.20	-5.32	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:	77.4	75.5	73.7	67.7	76.3	76.9
Medium Trucks:	73.8	72.2	65.9	64.3	72.8	73.0
Heavy Trucks:	78.4	77.0	67.9	69.2	77.5	77.6
Vehicle Noise:	81.7	80.1	75.3	72.3	80.7	81.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	322	694	1,494	3,219
CNEL:	338	729	1,570	3,383

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: n/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	210	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.64	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.88	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.83	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	54.8	53.1	47.0	55.6	56.2
Medium Trucks:	51.0	49.5	43.1	41.6	50.0	50.3
Heavy Trucks:	52.8	51.4	42.4	43.6	52.0	52.1
Vehicle Noise:	59.0	57.3	53.8	49.4	58.0	58.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	15	32	69
CNEL:	7	16	34	74

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: s/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	260	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.71	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-23.95	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-27.90	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.7	55.8	54.0	47.9	56.6	57.2
Medium Trucks:	51.9	50.4	44.0	42.5	51.0	51.2
Heavy Trucks:	53.8	52.3	43.3	44.6	52.9	53.0
Vehicle Noise:	59.9	58.2	54.7	50.4	58.9	59.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	17	37	80
CNEL:	9	18	40	85

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	420	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.17	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-20.40	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-24.36	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.6	53.7	52.0	45.9	54.5	55.2
Medium Trucks:	50.5	49.0	42.6	41.1	49.5	49.8
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	58.5	56.9	53.0	49.0	57.5	57.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	14	30	65
CNEL:	7	15	32	69

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	760	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.14	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.38	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.34	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.4	63.5	61.7	55.7	64.3	64.9
Medium Trucks:	59.2	57.7	51.3	49.8	58.2	58.5
Heavy Trucks:	60.0	58.6	49.6	50.8	59.2	59.3
Vehicle Noise:	67.2	65.5	62.3	57.7	66.2	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	114	246
CNEL:	26	57	122	264

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Irvington Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,430	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.40	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.64	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.59	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.1	66.2	64.5	58.4	67.0	67.6
Medium Trucks:	61.9	60.4	54.1	52.5	61.0	61.2
Heavy Trucks:	62.8	61.3	52.3	53.6	61.9	62.0
Vehicle Noise:	70.0	68.2	65.1	60.4	69.0	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	81	174	375
CNEL:	40	87	187	402

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,710	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.38	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.86	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.82	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.0	65.3	59.2	67.8	68.4
Medium Trucks:	62.7	61.2	54.8	53.3	61.7	62.0
Heavy Trucks:	63.5	62.1	53.1	54.3	62.7	62.8
Vehicle Noise:	70.8	69.0	65.9	61.2	69.7	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	91	196	422
CNEL:	45	98	210	453

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,640	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.27	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-14.97	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.93	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.8	68.9	67.1	61.1	69.7	70.3
Medium Trucks:	64.6	63.1	56.7	55.2	63.6	63.9
Heavy Trucks:	65.4	64.0	55.0	56.2	64.6	64.7
Vehicle Noise:	72.6	70.9	67.7	63.1	71.6	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	122	262	564
CNEL:	61	130	281	605

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,110	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.29	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.95	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.90	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.8	67.9	66.2	60.1	68.7	69.3
Medium Trucks:	63.6	62.1	55.7	54.2	62.7	62.9
Heavy Trucks:	64.5	63.0	54.0	55.2	63.6	63.7
Vehicle Noise:	71.7	69.9	66.8	62.1	70.6	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	49	105	226	486
CNEL:	52	112	242	521

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: Palm Av.
Road Segment: n/o Hallmark Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,160	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.31	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.54	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.50	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.3	63.6	57.5	66.1	66.7
Medium Trucks:	61.0	59.5	53.1	51.6	60.1	60.3
Heavy Trucks:	61.9	60.4	51.4	52.7	61.0	61.1
Vehicle Noise:	69.1	67.3	64.2	59.5	68.0	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	70	151	326
CNEL:	35	75	162	350

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: Palm Av.
Road Segment: s/o Hallmark Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	610	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.10	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.34	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.29	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.4	62.5	60.8	54.7	63.3	63.9
Medium Trucks:	58.2	56.7	50.4	48.8	57.3	57.5
Heavy Trucks:	59.1	57.6	48.6	49.9	58.2	58.3
Vehicle Noise:	66.3	64.5	61.4	56.7	65.3	65.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	46	99	212
CNEL:	23	49	106	228

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: Pine Av.
Road Segment: n/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	320	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.90	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-24.14	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.09	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.6	59.7	58.0	51.9	60.5	61.1
Medium Trucks:	55.4	53.9	47.6	46.0	54.5	54.7
Heavy Trucks:	56.3	54.8	45.8	47.1	55.4	55.5
Vehicle Noise:	63.5	61.7	58.6	53.9	62.5	62.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	30	64	138
CNEL:	15	32	69	148

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: Pine Av.
Road Segment: s/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	490	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-5.05	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-22.29	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.24	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.5	61.6	59.8	53.8	62.4	63.0
Medium Trucks:	57.3	55.8	49.4	47.9	56.3	56.6
Heavy Trucks:	58.1	56.7	47.7	48.9	57.3	57.4
Vehicle Noise:	65.3	63.6	60.4	55.8	64.3	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	40	85	184
CNEL:	20	42	91	197

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: Pine Av.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	940 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.22	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.46	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.41	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.7	56.6	65.2	65.8
Medium Trucks:	60.1	58.6	52.2	50.7	59.1	59.4
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	68.2	66.4	63.3	58.6	67.1	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	132	283
CNEL:	30	65	141	304

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: Campus Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	580 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.32	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.56	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.51	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	62.3	60.6	54.5	63.1	63.7
Medium Trucks:	58.0	56.5	50.1	48.6	57.1	57.3
Heavy Trucks:	58.8	57.4	48.4	49.6	58.0	58.1
Vehicle Noise:	66.1	64.3	61.2	56.5	65.0	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	44	95	205
CNEL:	22	47	102	220

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: University Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,290 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.22	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.02	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.97	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.8	69.9	68.1	62.1	70.7	71.3
Medium Trucks:	65.6	64.1	57.7	56.2	64.6	64.8
Heavy Trucks:	66.4	65.0	56.0	57.2	65.6	65.7
Vehicle Noise:	73.6	71.9	68.7	64.1	72.6	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	75	161	346	745
CNEL:	80	172	371	799

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: University Pkwy.
Road Segment: s/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,180 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.26	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-12.98	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-16.93	1.33	-1.20	-5.43	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:	72.8	70.9	69.2	63.1	71.7	72.3
Medium Trucks:	66.6	65.1	58.7	57.2	65.7	65.9
Heavy Trucks:	67.5	66.0	57.0	58.2	66.6	66.7
Vehicle Noise:	74.7	72.9	69.8	65.1	73.6	74.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	87	188	406	874
CNEL:	94	202	435	938

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	270 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.08	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.32	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.28	3.57	-1.20	-5.77	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:	56.0	54.1	52.3	46.2	54.9	55.5
Medium Trucks:	50.9	49.3	43.0	41.4	49.9	50.1
Heavy Trucks:	54.1	52.6	43.6	44.9	53.2	53.3
Vehicle Noise:	58.9	57.2	53.3	49.4	57.9	58.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	22	47
CNEL:	5	11	23	50

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	260 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.25	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.49	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.44	3.57	-1.20	-5.77	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:	55.8	53.9	52.1	46.1	54.7	55.3
Medium Trucks:	50.7	49.2	42.8	41.3	49.7	50.0
Heavy Trucks:	53.9	52.5	43.4	44.7	53.0	53.2
Vehicle Noise:	58.7	57.0	53.1	49.2	57.7	58.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	21	46
CNEL:	5	10	22	48

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	150 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.64	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-24.88	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-28.83	3.57	-1.20	-5.77	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:	53.4	51.5	49.7	43.7	52.3	52.9
Medium Trucks:	48.3	46.8	40.4	38.9	47.3	47.6
Heavy Trucks:	51.5	50.1	41.1	42.3	50.7	50.8
Vehicle Noise:	56.3	54.6	50.7	46.8	55.3	55.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	3	7	15	32
CNEL:	3	7	16	33

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	410 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.27	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.51	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.46	3.57	-1.20	-5.77	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:	57.8	55.9	54.1	48.1	56.7	57.3
Medium Trucks:	52.7	51.2	44.8	43.3	51.7	51.9
Heavy Trucks:	55.9	54.5	45.4	46.7	55.0	55.2
Vehicle Noise:	60.7	59.0	55.1	51.2	59.7	60.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	29	62
CNEL:	7	14	30	65

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	370 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.72	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.95	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.91	3.57	-1.20	-5.77	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:	57.3	55.4	53.7	47.6	56.2	56.8
Medium Trucks:	52.2	50.7	44.4	42.8	51.3	51.5
Heavy Trucks:	55.4	54.0	45.0	46.2	54.6	54.7
Vehicle Noise:	60.2	58.6	54.6	50.7	59.2	59.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	27	58
CNEL:	6	13	28	61

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Magnolia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	250 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.42	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.66	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.61	3.57	-1.20	-5.77	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:	55.6	53.7	52.0	45.9	54.5	55.1
Medium Trucks:	50.5	49.0	42.6	41.1	49.6	49.8
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	58.5	56.9	52.9	49.0	57.5	57.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	10	21	44
CNEL:	5	10	22	47

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	950 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.17	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.41	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.37	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.5	62.7	56.6	65.3	65.9
Medium Trucks:	60.1	58.6	52.3	50.7	59.2	59.4
Heavy Trucks:	61.0	59.6	50.5	51.8	60.1	60.3
Vehicle Noise:	68.2	66.5	63.3	58.6	67.2	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	61	132	285
CNEL:	31	66	142	306

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	780 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.03	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.27	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.22	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.5	63.6	61.8	55.8	64.4	65.0
Medium Trucks:	59.3	57.8	51.4	49.9	58.3	58.6
Heavy Trucks:	60.1	58.7	49.7	50.9	59.3	59.4
Vehicle Noise:	67.4	65.6	62.5	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	54	116	250
CNEL:	27	58	125	268

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: W. Little League Dr.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	240 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-8.15	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-25.39	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-29.34	3.57	-1.20	-5.77	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:	62.6	60.7	59.0	52.9	61.5	62.1
Medium Trucks:	56.4	54.9	48.6	47.0	55.5	55.7
Heavy Trucks:	57.3	55.9	46.8	48.1	56.4	56.6
Vehicle Noise:	64.5	62.7	59.6	54.9	63.4	63.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	11	24	51	110
CNEL:	12	25	55	118

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: Kendall Dr.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,810 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.63	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.61	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.57	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.2	67.3	65.5	59.5	68.1	68.7
Medium Trucks:	63.0	61.5	55.1	53.6	62.0	62.3
Heavy Trucks:	63.8	62.4	53.4	54.6	63.0	63.1
Vehicle Noise:	71.0	69.3	66.1	61.5	70.0	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	108	232	500
CNEL:	54	116	249	537

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: Kendall Dr.
Road Segment: w/o Pine Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,630 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.17	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.07	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.02	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.7	66.8	65.1	59.0	67.6	68.2
Medium Trucks:	62.5	61.0	54.6	53.1	61.6	61.8
Heavy Trucks:	63.4	61.9	52.9	54.2	62.5	62.6
Vehicle Noise:	70.6	68.8	65.7	61.0	69.5	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	101	217	467
CNEL:	50	108	232	500

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019
Road Name: Kendall Dr.
Road Segment: w/o Campus Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,230 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.53	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.71	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.66	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.1	68.2	66.4	60.4	69.0	69.6
Medium Trucks:	63.9	62.4	56.0	54.5	62.9	63.2
Heavy Trucks:	64.7	63.3	54.3	55.5	63.9	64.0
Vehicle Noise:	71.9	70.2	67.0	62.4	70.9	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	124	267	575
CNEL:	62	133	286	617

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | *Project Name:* Rancho Palma
Road Name: Kendall Dr. | *Job Number:* 9785
Road Segment: w/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,190	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.45	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-15.78	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-19.74	1.33	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.0	68.1	66.3	60.3	68.9	69.5
Medium Trucks:	63.8	62.3	55.9	54.4	62.8	63.1
Heavy Trucks:	64.6	63.2	54.2	55.4	63.8	63.9
Vehicle Noise:	71.9	70.1	67.0	62.3	70.8	71.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	57	122	264	568
CNEL:	61	131	283	609

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | *Project Name:* Rancho Palma
Road Name: Kendall Dr. | *Job Number:* 9785
Road Segment: e/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,990	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.04	1.30	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.20	1.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.16	1.33	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	63.4	61.9	55.5	54.0	62.4	62.7
Heavy Trucks:	64.2	62.8	53.8	55.0	63.4	63.5
Vehicle Noise:	71.4	69.7	66.5	61.9	70.4	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	53	115	247	533
CNEL:	57	123	265	572

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | *Project Name:* Rancho Palma
Road Name: I-215 Fwy. | *Job Number:* 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,060	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.77	1.91	0.27	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	85.95	-11.95	0.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	88.97	-10.35	0.29	-1.20	*-5.32*	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:	76.8	74.9	73.1	67.0	75.7	76.3
Medium Trucks:	73.1	71.6	65.2	63.7	72.1	72.4
Heavy Trucks:	77.7	76.3	67.3	68.5	76.9	77.0
Vehicle Noise:	81.0	79.4	74.6	71.6	80.1	80.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	291	627	1,352	2,912
CNEL:	306	659	1,420	3,060

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 | *Project Name:* Rancho Palma
Road Name: I-215 Fwy. | *Job Number:* 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	47,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,780	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.77	2.62	0.27	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	85.95	-11.24	0.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	88.97	-9.64	0.29	-1.20	*-5.32*	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:	77.5	75.6	73.8	67.7	76.4	77.0
Medium Trucks:	73.8	72.3	65.9	64.4	72.9	73.1
Heavy Trucks:	78.4	77.0	68.0	69.2	77.6	77.7
Vehicle Noise:	81.7	80.1	75.3	72.3	80.8	81.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	325	699	1,507	3,247
CNEL:	341	735	1,583	3,411

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: N. Little League Dr.
Road Segment: n/o W. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	240	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.06	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.30	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.25	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.3	55.4	53.7	47.6	56.2	56.8
Medium Trucks:	51.6	50.1	43.7	42.2	50.6	50.8
Heavy Trucks:	53.4	52.0	43.0	44.2	52.6	52.7
Vehicle Noise:	59.6	57.8	54.4	50.0	58.5	59.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	16	35	76
CNEL:	8	17	38	81

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: N. Little League Dr.
Road Segment: s/o W. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	320	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-5.81	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-23.05	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-27.00	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.6	56.7	54.9	48.9	57.5	58.1
Medium Trucks:	52.8	51.3	44.9	43.4	51.9	52.1
Heavy Trucks:	54.7	53.3	44.2	45.5	53.8	53.9
Vehicle Noise:	60.8	59.1	55.6	51.3	59.8	60.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	20	43	92
CNEL:	10	21	46	98

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Palm Av.
Road Segment: n/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	450	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-2.87	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-20.10	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-24.06	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.9	54.0	52.3	46.2	54.8	55.5
Medium Trucks:	50.8	49.3	42.9	41.4	49.8	50.1
Heavy Trucks:	54.0	52.6	43.6	44.8	53.2	53.3
Vehicle Noise:	58.8	57.2	53.3	49.3	57.8	58.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	15	32	68
CNEL:	7	16	34	72

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Palm Av.
Road Segment: s/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	830	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.76	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.00	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.95	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.8	63.9	62.1	56.1	64.7	65.3
Medium Trucks:	59.6	58.1	51.7	50.1	58.6	58.8
Heavy Trucks:	60.4	59.0	49.9	51.2	59.6	59.7
Vehicle Noise:	67.6	65.9	62.7	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	56	121	261
CNEL:	28	60	130	280

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Palm Av.
Road Segment: s/o Irvington Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,520 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.13	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.37	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.33	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	66.5	64.7	58.7	67.3	67.9
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.5
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	70.2	68.5	65.4	60.7	69.2	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	84	181	390
CNEL:	42	90	194	419

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Palm Av.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,810 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.63	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.61	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.57	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.2	67.3	65.5	59.4	68.1	68.7
Medium Trucks:	62.9	61.4	55.1	53.5	62.0	62.2
Heavy Trucks:	63.8	62.4	53.3	54.6	62.9	63.1
Vehicle Noise:	71.0	69.3	66.1	61.4	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	204	439
CNEL:	47	101	218	471

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Palm Av.
Road Segment: n/o I-215 Fwy. NB Ramps
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,800 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.52	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-14.72	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.67	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.1	69.2	67.4	61.3	70.0	70.6
Medium Trucks:	64.8	63.3	57.0	55.4	63.9	64.1
Heavy Trucks:	65.7	64.3	55.2	56.5	64.8	65.0
Vehicle Noise:	72.9	71.2	68.0	63.3	71.9	72.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	126	272	587
CNEL:	63	136	292	629

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Palm Av.
Road Segment: s/o I-215 Fwy. NB Ramps
Project Name: Rancho Palma
Job Number: 9785

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:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.49	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.75	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.70	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.0	68.1	66.4	60.3	68.9	69.5
Medium Trucks:	63.8	62.3	55.9	54.4	62.9	63.1
Heavy Trucks:	64.7	63.2	54.2	55.5	63.8	63.9
Vehicle Noise:	71.9	70.1	67.0	62.3	70.8	71.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	108	233	501
CNEL:	54	116	249	538

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Palm Av.
Road Segment: n/o Hallmark Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,210 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.12	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.36	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.32	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.4	65.5	63.7	57.7	66.3	66.9
Medium Trucks:	61.2	59.7	53.3	51.8	60.2	60.5
Heavy Trucks:	62.0	60.6	51.6	52.8	61.2	61.3
Vehicle Noise:	69.3	67.5	64.4	59.7	68.2	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	72	156	335
CNEL:	36	78	167	360

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Palm Av.
Road Segment: s/o Hallmark Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	640 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.89	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.13	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.08	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.6	62.7	61.0	54.9	63.5	64.2
Medium Trucks:	58.4	56.9	50.6	49.0	57.5	57.7
Heavy Trucks:	59.3	57.9	48.8	50.1	58.4	58.6
Vehicle Noise:	66.5	64.8	61.6	56.9	65.5	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	22	47	102	219
CNEL:	24	51	109	235

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Pine Av.
Road Segment: n/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	340 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.64	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-23.87	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-27.83	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.9	60.0	58.2	52.2	60.8	61.4
Medium Trucks:	55.7	54.2	47.8	46.3	54.7	55.0
Heavy Trucks:	56.5	55.1	46.1	47.3	55.7	55.8
Vehicle Noise:	63.7	62.0	58.8	54.2	62.7	63.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	31	67	144
CNEL:	15	33	72	154

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Pine Av.
Road Segment: s/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	550 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.55	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.79	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.74	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.0	62.1	60.3	54.3	62.9	63.5
Medium Trucks:	57.8	56.3	49.9	48.4	56.8	57.1
Heavy Trucks:	58.6	57.2	48.2	49.4	57.8	57.9
Vehicle Noise:	65.8	64.1	60.9	56.3	64.8	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	92	198
CNEL:	21	46	99	213

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Pine Av.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,010	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.91	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.15	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.10	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	64.7	63.0	56.9	65.5	66.1
Medium Trucks:	60.4	58.9	52.5	51.0	59.5	59.7
Heavy Trucks:	61.3	59.8	50.8	52.1	60.4	60.5
Vehicle Noise:	68.5	66.7	63.6	58.9	67.4	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	64	138	297
CNEL:	32	69	148	319

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Campus Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	590	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.24	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.48	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.44	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.3	62.4	60.6	54.6	63.2	63.8
Medium Trucks:	58.1	56.6	50.2	48.7	57.1	57.4
Heavy Trucks:	58.9	57.5	48.5	49.7	58.1	58.2
Vehicle Noise:	66.1	64.4	61.2	56.6	65.1	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	45	96	208
CNEL:	22	48	103	223

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: University Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

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:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.25	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.99	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.95	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.8	69.9	68.1	62.1	70.7	71.3
Medium Trucks:	65.6	64.1	57.7	56.2	64.6	64.9
Heavy Trucks:	66.4	65.0	56.0	57.2	65.6	65.7
Vehicle Noise:	73.7	71.9	68.8	64.1	72.6	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	75	161	347	748
CNEL:	80	173	372	803

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: University Pkwy.
Road Segment: s/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	42,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,210	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.29	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-12.95	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-16.90	1.33	-1.20	-5.43	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:	72.9	71.0	69.2	63.1	71.8	72.4
Medium Trucks:	66.6	65.1	58.8	57.2	65.7	65.9
Heavy Trucks:	67.5	66.1	57.0	58.3	66.6	66.8
Vehicle Noise:	74.7	73.0	69.8	65.1	73.7	74.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	88	189	408	878
CNEL:	94	203	437	942

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Belmont Av.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	290	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-4.77	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-22.01	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-25.97	3.57	-1.20	*-5.77*	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:	56.3	54.4	52.6	46.5	55.2	55.8
Medium Trucks:	51.2	49.7	43.3	41.7	50.2	50.4
Heavy Trucks:	54.4	53.0	43.9	45.2	53.5	53.6
Vehicle Noise:	59.2	57.5	53.6	49.7	58.2	58.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	5	11	23	49
CNEL:	5	11	24	52

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Belmont Av.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	280	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-4.93	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-22.17	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.12	3.57	-1.20	*-5.77*	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:	56.1	54.2	52.5	46.4	55.0	55.6
Medium Trucks:	51.0	49.5	43.1	41.6	50.1	50.3
Heavy Trucks:	54.2	52.8	43.8	45.0	53.4	53.5
Vehicle Noise:	59.0	57.4	53.4	49.5	58.0	58.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	5	10	22	48
CNEL:	5	11	24	51

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Belmont Av.
Road Segment: w/o Pine Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	190	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-6.61	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-23.85	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-27.80	3.57	-1.20	*-5.77*	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:	54.4	52.5	50.8	44.7	53.3	53.9
Medium Trucks:	49.3	47.8	41.5	39.9	48.4	48.6
Heavy Trucks:	52.5	51.1	42.1	43.3	51.7	51.8
Vehicle Noise:	57.3	55.7	51.7	47.8	56.4	56.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	4	8	17	37
CNEL:	4	8	18	39

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Irvington Av.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	420	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-3.17	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-20.40	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-24.36	3.57	-1.20	*-5.77*	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:	57.9	56.0	54.2	48.2	56.8	57.4
Medium Trucks:	52.8	51.3	44.9	43.4	51.8	52.0
Heavy Trucks:	56.0	54.6	45.5	46.8	55.1	55.3
Vehicle Noise:	60.8	59.1	55.2	51.3	59.8	60.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	13	29	63
CNEL:	7	14	31	66

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Irvington Av.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	380 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.60	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.84	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.79	3.57	-1.20	-5.77	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:	57.4	55.5	53.8	47.7	56.3	57.0
Medium Trucks:	52.3	50.8	44.5	42.9	51.4	51.6
Heavy Trucks:	55.5	54.1	45.1	46.3	54.7	54.8
Vehicle Noise:	60.4	58.7	54.8	50.9	59.4	59.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	27	59
CNEL:	6	13	29	62

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: W. Little League Dr.
Road Segment: w/o Magnolia Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	340 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.08	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.32	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.28	3.57	-1.20	-5.77	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:	57.0	55.1	53.3	47.2	55.9	56.5
Medium Trucks:	51.9	50.3	44.0	42.4	50.9	51.1
Heavy Trucks:	55.1	53.6	44.6	45.9	54.2	54.3
Vehicle Noise:	59.9	58.2	54.3	50.4	58.9	59.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	12	25	54
CNEL:	6	12	27	58

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Kendall Dr.
Road Segment: w/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	980 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.04	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.28	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.23	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.5	64.6	62.8	56.8	65.4	66.0
Medium Trucks:	60.3	58.8	52.4	50.9	59.3	59.6
Heavy Trucks:	61.1	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	68.3	66.6	63.4	58.8	67.3	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	63	135	291
CNEL:	31	67	145	313

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Kendall Dr.
Road Segment: e/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

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:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.87	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.10	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.06	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.7	63.8	62.0	56.0	64.6	65.2
Medium Trucks:	59.5	57.9	51.6	50.0	58.5	58.7
Heavy Trucks:	60.3	58.9	49.8	51.1	59.4	59.6
Vehicle Noise:	67.5	65.8	62.6	57.9	66.5	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	55	119	257
CNEL:	28	59	128	275

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: W. Little League Dr.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	640	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.89	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-21.13	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-25.08	3.57	-1.20	-5.77	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:	66.9	65.0	63.2	57.2	65.8	66.4
Medium Trucks:	60.7	59.2	52.8	51.3	59.7	60.0
Heavy Trucks:	61.5	60.1	51.1	52.3	60.7	60.8
Vehicle Noise:	68.7	67.0	63.8	59.2	67.7	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	45	98	211
CNEL:	23	49	105	226

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Kendall Dr.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,950	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.95	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.29	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.24	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.8	68.4	69.0
Medium Trucks:	63.3	61.8	55.4	53.9	62.3	62.6
Heavy Trucks:	64.1	62.7	53.7	54.9	63.3	63.4
Vehicle Noise:	71.4	69.6	66.5	61.8	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	113	244	526
CNEL:	56	122	262	564

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Kendall Dr.
Road Segment: w/o Pine Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,760	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.50	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.73	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.69	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	67.2	65.4	59.3	68.0	68.6
Medium Trucks:	62.9	61.3	55.0	53.4	61.9	62.1
Heavy Trucks:	63.7	62.3	53.2	54.5	62.8	63.0
Vehicle Noise:	70.9	69.2	66.0	61.3	69.9	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	49	106	228	491
CNEL:	53	113	244	527

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Kendall Dr.
Road Segment: w/o Campus Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,300	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.67	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.57	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.53	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.2	68.3	66.6	60.5	69.1	69.7
Medium Trucks:	64.0	62.5	56.1	54.6	63.1	63.3
Heavy Trucks:	64.9	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	72.1	70.3	67.2	62.5	71.0	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	126	272	587
CNEL:	63	136	292	630

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Kendall Dr.
Road Segment: w/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,250	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.57	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.67	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.62	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.1	68.2	66.5	60.4	69.0	69.6
Medium Trucks:	63.9	62.4	56.0	54.5	63.0	63.2
Heavy Trucks:	64.8	63.3	54.3	55.6	63.9	64.0
Vehicle Noise:	72.0	70.2	67.1	62.4	70.9	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	125	268	578
CNEL:	62	134	288	620

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Kendall Dr.
Road Segment: e/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,010	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.08	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.16	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.11	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	66.0	59.9	68.5	69.1
Medium Trucks:	63.4	61.9	55.6	54.0	62.5	62.7
Heavy Trucks:	64.3	62.8	53.8	55.1	63.4	63.5
Vehicle Noise:	71.5	69.7	66.6	61.9	70.5	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	116	249	537
CNEL:	58	124	267	575

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: I-215 Fwy.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,110	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	1.97	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-11.90	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-10.29	0.29	-1.20	-5.32	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:	76.8	74.9	73.1	67.1	75.7	76.3
Medium Trucks:	73.2	71.6	65.3	63.7	72.2	72.4
Heavy Trucks:	77.8	76.4	67.3	68.6	76.9	77.0
Vehicle Noise:	81.1	79.5	74.7	71.7	80.1	80.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	294	632	1,363	2,936
CNEL:	308	665	1,432	3,085

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: I-215 Fwy.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	48,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,830	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	81	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	62.0	feet
Centerline Dist. to Observer:	62.0	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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	2.67	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-11.20	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-9.59	0.29	-1.20	-5.32	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:	77.5	75.6	73.8	67.8	76.4	77.0
Medium Trucks:	73.9	72.3	66.0	64.4	72.9	73.1
Heavy Trucks:	78.5	77.1	68.0	69.3	77.6	77.7
Vehicle Noise:	81.8	80.2	75.4	72.4	80.8	81.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	327	704	1,517	3,269
CNEL:	344	740	1,594	3,435

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: n/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	240	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.06	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-24.30	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-28.25	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.3	55.4	53.7	47.6	56.2	56.8
Medium Trucks:	51.6	50.1	43.7	42.2	50.6	50.8
Heavy Trucks:	53.4	52.0	43.0	44.2	52.6	52.7
Vehicle Noise:	59.6	57.8	54.4	50.0	58.5	59.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	16	35	76
CNEL:	8	17	38	81

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: s/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	310	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-5.95	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-23.18	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-27.14	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.4	56.5	54.8	48.7	57.3	57.9
Medium Trucks:	52.7	51.2	44.8	43.3	51.7	52.0
Heavy Trucks:	54.5	53.1	44.1	45.3	53.7	53.8
Vehicle Noise:	60.7	59.0	55.5	51.1	59.7	60.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	42	90
CNEL:	10	21	45	96

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	660	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-1.20	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-18.44	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-22.40	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.6	55.7	53.9	47.9	56.5	57.1
Medium Trucks:	52.5	51.0	44.6	43.1	51.5	51.7
Heavy Trucks:	55.7	54.3	45.2	46.5	54.8	55.0
Vehicle Noise:	60.5	58.8	54.9	51.0	59.5	59.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	41	88
CNEL:	9	20	43	93

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	920	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.31	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.55	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.51	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.3	62.6	56.5	65.1	65.7
Medium Trucks:	60.0	58.5	52.1	50.6	59.1	59.3
Heavy Trucks:	60.9	59.4	50.4	51.6	60.0	60.1
Vehicle Noise:	68.1	66.3	63.2	58.5	67.0	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	60	130	279
CNEL:	30	65	139	300

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Irvington Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,720 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.40	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.83	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.79	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.0	65.3	59.2	67.8	68.4
Medium Trucks:	62.7	61.2	54.9	53.3	61.8	62.0
Heavy Trucks:	63.6	62.1	53.1	54.4	62.7	62.8
Vehicle Noise:	70.8	69.0	65.9	61.2	69.8	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	91	197	424
CNEL:	45	98	211	455

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,060 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.19	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.05	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.01	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	67.8	66.1	60.0	68.6	69.2
Medium Trucks:	63.5	62.0	55.6	54.1	62.6	62.8
Heavy Trucks:	64.4	62.9	53.9	55.1	63.5	63.6
Vehicle Noise:	71.6	69.8	66.7	62.0	70.5	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	103	222	478
CNEL:	51	111	238	513

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,150 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.03	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-14.21	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.16	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.6	69.7	67.9	61.8	70.5	71.1
Medium Trucks:	65.4	63.8	57.5	55.9	64.4	64.6
Heavy Trucks:	66.2	64.8	55.7	57.0	65.3	65.5
Vehicle Noise:	73.4	71.7	68.5	63.8	72.4	72.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	63	137	295	635
CNEL:	68	147	316	681

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,510 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.05	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.19	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.15	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.6	68.7	66.9	60.9	69.5	70.1
Medium Trucks:	64.4	62.9	56.5	55.0	63.4	63.6
Heavy Trucks:	65.2	63.8	54.8	56.0	64.4	64.5
Vehicle Noise:	72.4	70.7	67.5	62.9	71.4	71.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	253	545
CNEL:	59	126	272	585

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Palm Av.
Road Segment: n/o Hallmark Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,360 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.62	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.85	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.81	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.9	66.0	64.3	58.2	66.8	67.4
Medium Trucks:	61.7	60.2	53.8	52.3	60.8	61.0
Heavy Trucks:	62.6	61.1	52.1	53.3	61.7	61.8
Vehicle Noise:	69.8	68.0	64.9	60.2	68.7	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	78	168	363
CNEL:	39	84	181	389

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Palm Av.
Road Segment: s/o Hallmark Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	710 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.44	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.68	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.63	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.1	63.2	61.4	55.4	64.0	64.6
Medium Trucks:	58.9	57.4	51.0	49.5	57.9	58.2
Heavy Trucks:	59.7	58.3	49.3	50.5	58.9	59.0
Vehicle Noise:	66.9	65.2	62.0	57.4	65.9	66.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	51	109	235
CNEL:	25	54	117	252

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Pine Av.
Road Segment: n/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	530 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.71	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.95	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.90	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.8	61.9	60.2	54.1	62.7	63.3
Medium Trucks:	57.6	56.1	49.7	48.2	56.7	56.9
Heavy Trucks:	58.5	57.0	48.0	49.2	57.6	57.7
Vehicle Noise:	65.7	63.9	60.8	56.1	64.6	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	42	90	193
CNEL:	21	45	96	207

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Pine Av.
Road Segment: s/o Belmont Av.
Project Name: Rancho Palma
Job Number: 9785

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:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.63	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.87	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.82	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.9	62.0	60.2	54.2	62.8	63.4
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	58.5	57.1	48.1	49.3	57.7	57.8
Vehicle Noise:	65.8	64.0	60.9	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	42	91	196
CNEL:	21	45	98	210

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Pine Av.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,040 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.78	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.02	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.97	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.8	64.9	63.1	57.0	65.7	66.3
Medium Trucks:	60.5	59.0	52.7	51.1	59.6	59.8
Heavy Trucks:	61.4	60.0	50.9	52.2	60.5	60.7
Vehicle Noise:	68.6	66.9	63.7	59.0	67.6	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	65	141	303
CNEL:	33	70	151	325

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Campus Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.26	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.50	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.45	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.3	63.4	61.6	55.6	64.2	64.8
Medium Trucks:	59.1	57.6	51.2	49.6	58.1	58.3
Heavy Trucks:	59.9	58.5	49.4	50.7	59.1	59.2
Vehicle Noise:	67.1	65.4	62.2	57.6	66.1	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	52	112	242
CNEL:	26	56	120	259

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: University Pkwy.
Road Segment: n/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,950 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.01	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.22	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.18	1.33	-1.20	-5.43	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:	72.6	70.7	68.9	62.9	71.5	72.1
Medium Trucks:	66.4	64.9	58.5	56.9	65.4	65.6
Heavy Trucks:	67.2	65.8	56.7	58.0	66.4	66.5
Vehicle Noise:	74.4	72.7	69.5	64.9	73.4	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	181	391	842
CNEL:	90	195	419	903

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: University Pkwy.
Road Segment: s/o Kendall Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	50,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,010 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	5.05	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-12.19	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-16.15	1.33	-1.20	-5.43	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:	73.6	71.7	69.9	63.9	72.5	73.1
Medium Trucks:	67.4	65.9	59.5	58.0	66.4	66.7
Heavy Trucks:	68.2	66.8	57.8	59.0	67.4	67.5
Vehicle Noise:	75.5	73.7	70.6	65.9	74.4	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	99	212	458	986
CNEL:	106	228	491	1,058

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Belmont Av.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	300	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.63	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.87	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.82	3.57	-1.20	-5.77	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:	56.4	54.5	52.8	46.7	55.3	55.9
Medium Trucks:	51.3	49.8	43.4	41.9	50.4	50.6
Heavy Trucks:	54.5	53.1	44.1	45.3	53.7	53.8
Vehicle Noise:	59.3	57.7	53.7	49.8	58.3	58.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	11	23	50
CNEL:	5	11	25	53

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Belmont Av.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	300	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.63	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.87	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.82	3.57	-1.20	-5.77	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:	56.4	54.5	52.8	46.7	55.3	55.9
Medium Trucks:	51.3	49.8	43.4	41.9	50.4	50.6
Heavy Trucks:	54.5	53.1	44.1	45.3	53.7	53.8
Vehicle Noise:	59.3	57.7	53.7	49.8	58.3	58.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	11	23	50
CNEL:	5	11	25	53

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Belmont Av.
Road Segment: w/o Pine Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	160	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.36	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-24.60	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-28.55	3.57	-1.20	-5.77	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:	53.7	51.8	50.0	44.0	52.6	53.2
Medium Trucks:	48.6	47.1	40.7	39.2	47.6	47.9
Heavy Trucks:	51.8	50.4	41.3	42.6	50.9	51.1
Vehicle Noise:	56.6	54.9	51.0	47.1	55.6	56.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	3	7	15	33
CNEL:	3	8	16	35

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Irvington Av.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	450	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-2.87	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.10	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.06	3.57	-1.20	-5.77	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:	58.2	56.3	54.5	48.5	57.1	57.7
Medium Trucks:	53.1	51.6	45.2	43.7	52.1	52.3
Heavy Trucks:	56.3	54.9	45.8	47.1	55.4	55.6
Vehicle Noise:	61.1	59.4	55.5	51.6	60.1	60.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	14	30	66
CNEL:	7	15	32	70

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Irvington Av.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	410 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.27	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.51	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.46	3.57	-1.20	-5.77	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:	57.8	55.9	54.1	48.1	56.7	57.3
Medium Trucks:	52.7	51.2	44.8	43.3	51.7	51.9
Heavy Trucks:	55.9	54.5	45.4	46.7	55.0	55.2
Vehicle Noise:	60.7	59.0	55.1	51.2	59.7	60.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	29	62
CNEL:	7	14	30	65

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: W. Little League Dr.
Road Segment: w/o Magnolia Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	270 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-5.08	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.32	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.28	3.57	-1.20	-5.77	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:	56.0	54.1	52.3	46.2	54.9	55.5
Medium Trucks:	50.9	49.3	43.0	41.4	49.9	50.1
Heavy Trucks:	54.1	52.6	43.6	44.9	53.2	53.3
Vehicle Noise:	58.9	57.2	53.3	49.4	57.9	58.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	22	47
CNEL:	5	11	23	50

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Kendall Dr.
Road Segment: w/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,140 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.38	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.62	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.58	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.3	63.5	57.4	66.1	66.7
Medium Trucks:	60.9	59.4	53.1	51.5	60.0	60.2
Heavy Trucks:	61.8	60.4	51.3	52.6	60.9	61.1
Vehicle Noise:	69.0	67.3	64.1	59.4	68.0	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	69	150	322
CNEL:	35	74	160	346

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Kendall Dr.
Road Segment: e/o N. Little League Dr.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	940 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.22	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.46	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.41	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.7	56.6	65.2	65.8
Medium Trucks:	60.1	58.6	52.2	50.7	59.1	59.4
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	68.2	66.4	63.3	58.6	67.1	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	132	283
CNEL:	30	65	141	304

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	760 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.14	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-20.38	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-24.34	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.6	65.7	64.0	57.9	66.5	67.1
Medium Trucks:	61.4	59.9	53.6	52.0	60.5	60.7
Heavy Trucks:	62.3	60.9	51.8	53.1	61.4	61.6
Vehicle Noise:	69.5	67.7	64.6	59.9	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	51	110	237
CNEL:	25	55	118	254

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,990 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.04	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.20	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.16	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	63.4	61.9	55.5	54.0	62.4	62.7
Heavy Trucks:	64.2	62.8	53.8	55.0	63.4	63.5
Vehicle Noise:	71.4	69.7	66.5	61.9	70.4	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	115	247	533
CNEL:	57	123	265	572

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,840 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.70	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.54	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.50	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.3	67.4	65.6	59.5	68.2	68.8
Medium Trucks:	63.0	61.5	55.2	53.6	62.1	62.3
Heavy Trucks:	63.9	62.5	53.4	54.7	63.0	63.2
Vehicle Noise:	71.1	69.4	66.2	61.5	70.1	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	51	109	235	506
CNEL:	54	117	252	543

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Campus Pkwy.

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:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.31	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.92	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.88	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.9	69.0	67.2	61.2	69.8	70.4
Medium Trucks:	64.7	63.2	56.8	55.2	63.7	63.9
Heavy Trucks:	65.5	64.1	55.0	56.3	64.7	64.8
Vehicle Noise:	72.7	71.0	67.8	63.2	71.7	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	65	140	301	648
CNEL:	70	150	323	695

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Kendall Dr.
Road Segment: w/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,620 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.23	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.01	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.96	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.8	68.9	67.1	61.1	69.7	70.3
Medium Trucks:	64.6	63.1	56.7	55.2	63.6	63.9
Heavy Trucks:	65.4	64.0	55.0	56.2	64.6	64.7
Vehicle Noise:	72.6	70.9	67.7	63.1	71.6	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	64	138	297	640
CNEL:	69	148	319	687

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: Kendall Dr.
Road Segment: e/o University Pkwy.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,390 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.83	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.41	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.36	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.4	68.5	66.7	60.7	69.3	69.9
Medium Trucks:	64.2	62.7	56.3	54.8	63.2	63.5
Heavy Trucks:	65.0	63.6	54.6	55.8	64.2	64.3
Vehicle Noise:	72.2	70.5	67.3	62.7	71.2	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	60	130	280	602
CNEL:	65	139	300	646

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: I-215 Fwy.
Road Segment: w/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	80,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,070 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	62.0 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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	4.90	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-8.97	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-7.36	0.29	-1.20	-5.32	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:	79.7	77.8	76.1	70.0	78.6	79.2
Medium Trucks:	76.1	74.6	68.2	66.7	75.1	75.4
Heavy Trucks:	80.7	79.3	70.2	71.5	79.9	80.0
Vehicle Noise:	84.0	82.4	77.6	74.6	83.1	83.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	460	992	2,137	4,603
CNEL:	484	1,042	2,245	4,837

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2035 Without Project
Road Name: I-215 Fwy.
Road Segment: e/o Palm Av.
Project Name: Rancho Palma
Job Number: 9785

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	91,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	9,120 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	62.0 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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	5.43	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-8.44	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-6.83	0.29	-1.20	-5.32	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:	80.3	78.4	76.6	70.6	79.2	79.8
Medium Trucks:	76.6	75.1	68.7	67.2	75.7	75.9
Heavy Trucks:	81.2	79.8	70.8	72.0	80.4	80.5
Vehicle Noise:	84.6	82.9	78.1	75.1	83.6	83.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	499	1,076	2,318	4,994
CNEL:	525	1,131	2,436	5,248

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: n/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	260	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.71	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-23.95	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-27.90	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.7	55.8	54.0	47.9	56.6	57.2
Medium Trucks:	51.9	50.4	44.0	42.5	51.0	51.2
Heavy Trucks:	53.8	52.3	43.3	44.6	52.9	53.0
Vehicle Noise:	59.9	58.2	54.7	50.4	58.9	59.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	17	37	80
CNEL:	9	18	40	85

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: N. Little League Dr. | Job Number: 9785
Road Segment: s/o W. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	370	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-5.18	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	75.75	-22.42	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-26.37	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.2	57.3	55.5	49.5	58.1	58.7
Medium Trucks:	53.4	51.9	45.6	44.0	52.5	52.7
Heavy Trucks:	55.3	53.9	44.8	46.1	54.5	54.6
Vehicle Noise:	61.4	59.7	56.3	51.9	60.4	60.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	10	22	47	101
CNEL:	11	23	50	108

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	670	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-1.14	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	70.80	-18.38	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-22.33	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.7	55.8	54.0	48.0	56.6	57.2
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	55.7	54.3	45.3	46.5	54.9	55.0
Vehicle Noise:	60.6	58.9	55.0	51.1	59.6	60.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	41	89
CNEL:	9	20	44	94

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	980	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.04	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.28	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.23	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.5	64.6	62.8	56.8	65.4	66.0
Medium Trucks:	60.3	58.8	52.4	50.9	59.3	59.6
Heavy Trucks:	61.1	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	68.3	66.6	63.4	58.8	67.3	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	63	135	291
CNEL:	31	67	145	313

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o Irvington Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,810	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.63	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-16.61	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.57	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.2	67.3	65.5	59.4	68.1	68.7
Medium Trucks:	62.9	61.4	55.1	53.5	62.0	62.2
Heavy Trucks:	63.8	62.4	53.3	54.6	62.9	63.1
Vehicle Noise:	71.0	69.3	66.1	61.4	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	204	439
CNEL:	47	101	218	471

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,170	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.41	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.82	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.78	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.0	68.1	66.3	60.2	68.9	69.5
Medium Trucks:	63.7	62.2	55.9	54.3	62.8	63.0
Heavy Trucks:	64.6	63.2	54.1	55.4	63.7	63.9
Vehicle Noise:	71.8	70.1	66.9	62.2	70.8	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	107	230	495
CNEL:	53	114	246	531

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: n/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,320	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.26	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-13.98	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.93	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.8	69.9	68.1	62.1	70.7	71.3
Medium Trucks:	65.6	64.1	57.7	56.2	64.6	64.9
Heavy Trucks:	66.4	65.0	56.0	57.2	65.6	65.7
Vehicle Noise:	73.6	71.9	68.7	64.1	72.6	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	66	142	305	657
CNEL:	71	152	327	705

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Palm Av. | Job Number: 9785
Road Segment: s/o I-215 Fwy. NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,610	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.22	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-15.02	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.98	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.8	68.9	67.1	61.0	69.7	70.3
Medium Trucks:	64.5	63.0	56.7	55.1	63.6	63.8
Heavy Trucks:	65.4	64.0	54.9	56.2	64.5	64.7
Vehicle Noise:	72.6	70.9	67.7	63.0	71.6	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	260	560
CNEL:	60	129	279	601

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | *Project Name:* Rancho Palma
Road Name: Palm Av. | *Job Number:* 9785
Road Segment: n/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,400	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.49	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-17.73	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-21.68	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.0	66.1	64.4	58.3	66.9	67.6
Medium Trucks:	61.8	60.3	54.0	52.4	60.9	61.1
Heavy Trucks:	62.7	61.3	52.2	53.5	61.8	62.0
Vehicle Noise:	69.9	68.2	65.0	60.3	68.9	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	80	172	370
CNEL:	40	85	184	396

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | *Project Name:* Rancho Palma
Road Name: Palm Av. | *Job Number:* 9785
Road Segment: s/o Hallmark Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	740	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.26	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-20.50	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-24.45	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.3	63.4	61.6	55.6	64.2	64.8
Medium Trucks:	59.1	57.6	51.2	49.6	58.1	58.3
Heavy Trucks:	59.9	58.5	49.4	50.7	59.1	59.2
Vehicle Noise:	67.1	65.4	62.2	57.6	66.1	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	52	112	242
CNEL:	26	56	120	259

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | *Project Name:* Rancho Palma
Road Name: Pine Av. | *Job Number:* 9785
Road Segment: n/o Belmont Av.

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:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-4.63	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-21.87	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-25.82	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.9	62.0	60.2	54.2	62.8	63.4
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	58.5	57.1	48.1	49.3	57.7	57.8
Vehicle Noise:	65.8	64.0	60.9	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	20	42	91	196
CNEL:	21	45	98	210

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | *Project Name:* Rancho Palma
Road Name: Pine Av. | *Job Number:* 9785
Road Segment: s/o Belmont Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	590	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-4.24	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-21.48	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-25.44	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.3	62.4	60.6	54.6	63.2	63.8
Medium Trucks:	58.1	56.6	50.2	48.7	57.1	57.4
Heavy Trucks:	58.9	57.5	48.5	49.7	58.1	58.2
Vehicle Noise:	66.1	64.4	61.2	56.6	65.1	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	21	45	96	208
CNEL:	22	48	103	223

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Pine Av. | Job Number: 9785
Road Segment: n/o Kendall Dr.

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:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.62	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.86	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.81	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.9	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	60.7	59.2	52.8	51.3	59.8	60.0
Heavy Trucks:	61.5	60.1	51.1	52.3	60.7	60.8
Vehicle Noise:	68.8	67.0	63.9	59.2	67.7	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	67	144	311
CNEL:	33	72	155	333

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Campus Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	760	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.14	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.38	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.34	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.4	63.5	61.7	55.7	64.3	64.9
Medium Trucks:	59.2	57.7	51.3	49.8	58.2	58.5
Heavy Trucks:	60.0	58.6	49.6	50.8	59.2	59.3
Vehicle Noise:	67.2	65.5	62.3	57.7	66.2	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	114	246
CNEL:	26	57	122	264

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: n/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,960	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.03	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.21	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.17	1.33	-1.20	-5.43	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:	72.6	70.7	68.9	62.9	71.5	72.1
Medium Trucks:	66.4	64.9	58.5	57.0	65.4	65.7
Heavy Trucks:	67.2	65.8	56.8	58.0	66.4	66.5
Vehicle Noise:	74.4	72.7	69.5	64.9	73.4	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	182	391	843
CNEL:	90	195	420	904

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: University Pkwy. | Job Number: 9785
Road Segment: s/o Kendall Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	50,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	5,030	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	5.06	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-12.17	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-16.13	1.33	-1.20	-5.43	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:	73.6	71.7	70.0	63.9	72.5	73.1
Medium Trucks:	67.4	65.9	59.5	58.0	66.5	66.7
Heavy Trucks:	68.3	66.8	57.8	59.0	67.4	67.5
Vehicle Noise:	75.5	73.7	70.6	65.9	74.4	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	99	213	459	989
CNEL:	106	229	492	1,061

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	330	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.21	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.45	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.41	3.57	-1.20	-5.77	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:	56.8	54.9	53.2	47.1	55.7	56.3
Medium Trucks:	51.7	50.2	43.9	42.3	50.8	51.0
Heavy Trucks:	54.9	53.5	44.5	45.7	54.1	54.2
Vehicle Noise:	59.7	58.1	54.1	50.2	58.7	59.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	11	25	53
CNEL:	6	12	26	57

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	310	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.48	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.72	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.68	3.57	-1.20	-5.77	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:	56.6	54.7	52.9	46.8	55.5	56.1
Medium Trucks:	51.5	49.9	43.6	42.0	50.5	50.7
Heavy Trucks:	54.7	53.2	44.2	45.5	53.8	53.9
Vehicle Noise:	59.5	57.8	53.9	50.0	58.5	58.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	11	24	51
CNEL:	5	12	25	54

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Belmont Av. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	200	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.39	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.63	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.58	3.57	-1.20	-5.77	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:	54.7	52.8	51.0	44.9	53.6	54.2
Medium Trucks:	49.5	48.0	41.7	40.1	48.6	48.8
Heavy Trucks:	52.8	51.3	42.3	43.6	51.9	52.0
Vehicle Noise:	57.6	55.9	52.0	48.1	56.6	57.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	8	18	38
CNEL:	4	9	19	41

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	480	vehicles
Vehicle Speed:	25	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-2.59	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-19.82	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-23.78	3.57	-1.20	-5.77	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:	58.5	56.6	54.8	48.7	57.4	58.0
Medium Trucks:	53.3	51.8	45.5	43.9	52.4	52.6
Heavy Trucks:	56.6	55.1	46.1	47.4	55.7	55.8
Vehicle Noise:	61.4	59.7	55.8	51.9	60.4	60.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	15	32	68
CNEL:	7	16	34	73

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Irvington Av. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	420 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.17	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.40	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.36	3.57	-1.20	-5.77	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:	57.9	56.0	54.2	48.2	56.8	57.4
Medium Trucks:	52.8	51.3	44.9	43.4	51.8	52.0
Heavy Trucks:	56.0	54.6	45.5	46.8	55.1	55.3
Vehicle Noise:	60.8	59.1	55.2	51.3	59.8	60.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	29	63
CNEL:	7	14	31	66

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Magnolia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	370 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.72	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.95	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.91	3.57	-1.20	-5.77	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:	57.3	55.4	53.7	47.6	56.2	56.8
Medium Trucks:	52.2	50.7	44.4	42.8	51.3	51.5
Heavy Trucks:	55.4	54.0	45.0	46.2	54.6	54.7
Vehicle Noise:	60.2	58.6	54.6	50.7	59.2	59.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	27	58
CNEL:	6	13	28	61

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,180 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.23	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.47	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.43	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.3	65.4	63.6	57.6	66.2	66.8
Medium Trucks:	61.1	59.6	53.2	51.7	60.1	60.4
Heavy Trucks:	61.9	60.5	51.5	52.7	61.1	61.2
Vehicle Noise:	69.1	67.4	64.3	59.6	68.1	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	71	153	330
CNEL:	35	76	164	354

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o N. Little League Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	960 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.13	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.37	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.32	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.5	62.7	56.7	65.3	65.9
Medium Trucks:	60.2	58.7	52.3	50.8	59.2	59.5
Heavy Trucks:	61.0	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	68.3	66.5	63.4	58.7	67.2	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	62	133	287
CNEL:	31	66	143	308

Tuesday, November 24, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: W. Little League Dr. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,150	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.34	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-18.58	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-22.54	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.4	67.5	65.8	59.7	68.3	68.9
Medium Trucks:	63.2	61.7	55.4	53.8	62.3	62.5
Heavy Trucks:	64.1	62.7	53.6	54.9	63.2	63.4
Vehicle Noise:	71.3	69.5	66.4	61.7	70.3	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	67	145	312
CNEL:	33	72	155	335

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,110	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.29	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.95	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.90	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.9	68.0	66.2	60.1	68.8	69.4
Medium Trucks:	63.6	62.1	55.8	54.2	62.7	62.9
Heavy Trucks:	64.5	63.1	54.0	55.3	63.6	63.8
Vehicle Noise:	71.7	70.0	66.8	62.1	70.7	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	119	257	554
CNEL:	59	128	276	594

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Pine Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,960	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.97	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.27	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.22	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.9	59.8	68.4	69.0
Medium Trucks:	63.3	61.8	55.4	53.9	62.4	62.6
Heavy Trucks:	64.2	62.7	53.7	55.0	63.3	63.4
Vehicle Noise:	71.4	69.6	66.5	61.8	70.4	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	245	528
CNEL:	57	122	263	566

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o Campus Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,740	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	60	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000	
Medium Trucks:	2.297	
Heavy Trucks:	8.006	Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.43	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.81	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.77	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.0	69.1	67.3	61.3	69.9	70.5
Medium Trucks:	64.8	63.3	56.9	55.4	63.8	64.1
Heavy Trucks:	65.6	64.2	55.2	56.4	64.8	64.9
Vehicle Noise:	72.8	71.1	67.9	63.3	71.8	72.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	66	142	306	660
CNEL:	71	152	328	708

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: w/o University Pkwy.

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:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.31	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.92	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.88	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.9	69.0	67.2	61.2	69.8	70.4
Medium Trucks:	64.7	63.2	56.8	55.2	63.7	63.9
Heavy Trucks:	65.5	64.1	55.0	56.3	64.7	64.8
Vehicle Noise:	72.7	71.0	67.8	63.2	71.7	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	65	140	301	648
CNEL:	70	150	323	695

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: Kendall Dr. | Job Number: 9785
Road Segment: e/o University Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,410 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	60 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.311
Medium Trucks:	40.091
Heavy Trucks:	40.113

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.87	1.30	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.37	1.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.33	1.33	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.4	68.5	66.8	60.7	69.3	69.9
Medium Trucks:	64.2	62.7	56.3	54.8	63.3	63.5
Heavy Trucks:	65.1	63.6	54.6	55.9	64.2	64.3
Vehicle Noise:	72.3	70.5	67.4	62.7	71.2	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	130	281	606
CNEL:	65	140	301	650

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: I-215 Fwy. | Job Number: 9785
Road Segment: w/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,120 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	62.0 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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	4.92	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-8.94	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-7.34	0.29	-1.20	-5.32	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:	79.8	77.9	76.1	70.0	78.7	79.3
Medium Trucks:	76.1	74.6	68.2	66.7	75.2	75.4
Heavy Trucks:	80.7	79.3	70.3	71.5	79.9	80.0
Vehicle Noise:	84.0	82.4	77.6	74.6	83.1	83.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	462	996	2,145	4,622
CNEL:	486	1,046	2,254	4,857

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2019 | Project Name: Rancho Palma
Road Name: I-215 Fwy. | Job Number: 9785
Road Segment: e/o Palm Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	91,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	9,180 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	62.0 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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	47.210
Medium Trucks:	47.022
Heavy Trucks:	47.040

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	75.77	5.46	0.27	-1.20	-4.70	0.000	0.000
Medium Trucks:	85.95	-8.41	0.30	-1.20	-4.88	0.000	0.000
Heavy Trucks:	88.97	-6.80	0.29	-1.20	-5.32	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:	80.3	78.4	76.6	70.6	79.2	79.8
Medium Trucks:	76.6	75.1	68.8	67.2	75.7	75.9
Heavy Trucks:	81.3	79.8	70.8	72.1	80.4	80.5
Vehicle Noise:	84.6	83.0	78.2	75.2	83.6	83.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	502	1,081	2,328	5,016
CNEL:	527	1,136	2,447	5,271

Tuesday, November 24, 2015

APPENDIX 8.1:

ON-SITE TRAFFIC NOISE CALCULATIONS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: I-215 Freeway
Lot No: 50

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	150.0 feet
Centerline Dist. to Observer:	160.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,749.0 feet
Road Elevation:	1,749.0 feet
Barrier Elevation:	1,749.0 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,749.000		
Medium Trucks:	1,751.297		
Heavy Trucks:	1,757.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	155.480
Medium Trucks:	155.355
Heavy Trucks:	155.203

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-7.49	-1.20	*0.94*	-10.120	-13.120
Medium Trucks:	82.53	-8.95	-7.49	-1.20	*0.88*	-9.940	-12.940
Heavy Trucks:	85.83	-7.34	-7.48	-1.20	*0.73*	-9.420	-12.420

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.0	71.1	69.4	63.3	71.9	72.5
Medium Trucks:	64.9	63.4	57.0	55.5	63.9	64.2
Heavy Trucks:	69.8	68.4	59.3	60.6	69.0	69.1
Vehicle Noise:	75.1	73.4	70.0	65.6	74.1	74.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	62.9	61.0	59.2	53.2	61.8	62.4
Medium Trucks:	55.0	53.5	47.1	45.5	54.0	54.2
Heavy Trucks:	60.4	59.0	49.9	51.2	59.5	59.7
Vehicle Noise:	65.3	63.6	59.9	55.7	64.3	64.7

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: W. Little League Dr. e/o Magnolia Av.
Lot No: 50

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	560 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,749.0 feet
Road Elevation:	1,749.0 feet
Barrier Elevation:	1,749.0 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,749.000		
Medium Trucks:	1,751.297		
Heavy Trucks:	1,757.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	41.690
Medium Trucks:	41.101
Heavy Trucks:	40.367

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-3.38	1.08	-1.20	*1.74*	-11.780	-14.780
Medium Trucks:	74.83	-20.62	1.17	-1.20	*1.39*	-11.080	-14.080
Heavy Trucks:	80.05	-24.57	1.29	-1.20	*0.66*	-9.180	-12.180

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.6	59.7	57.9	51.9	60.5	61.1
Medium Trucks:	54.2	52.7	46.3	44.8	53.2	53.5
Heavy Trucks:	55.6	54.1	45.1	46.4	54.7	54.8
Vehicle Noise:	63.2	61.4	58.4	53.6	62.1	62.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.8	47.9	46.2	40.1	48.7	49.3
Medium Trucks:	43.1	41.6	35.2	33.7	42.2	42.4
Heavy Trucks:	46.4	45.0	35.9	37.2	45.5	45.7
Vehicle Noise:	52.0	50.3	46.9	42.5	51.0	51.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: I-215 Freeway
Lot No: 55

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	150.0 feet
Centerline Dist. to Observer:	160.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,740.5 feet
Road Elevation:	1,743.0 feet
Barrier Elevation:	1,740.5 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,743.000		
Medium Trucks:	1,745.297		
Heavy Trucks:	1,751.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	155.346
Medium Trucks:	155.261
Heavy Trucks:	155.207

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-7.49	-1.20	*0.87*	-9.910	-12.910
Medium Trucks:	82.53	-8.95	-7.48	-1.20	*0.81*	-9.730	-12.730
Heavy Trucks:	85.83	-7.34	-7.48	-1.20	*0.67*	-9.210	-12.210

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.0	71.1	69.4	63.3	71.9	72.5
Medium Trucks:	64.9	63.4	57.0	55.5	64.0	64.2
Heavy Trucks:	69.8	68.4	59.3	60.6	69.0	69.1
Vehicle Noise:	75.1	73.4	70.0	65.6	74.1	74.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.1	61.2	59.4	53.4	62.0	62.6
Medium Trucks:	55.2	53.7	47.3	45.8	54.2	54.5
Heavy Trucks:	60.6	59.2	50.1	51.4	59.7	59.9
Vehicle Noise:	65.5	63.8	60.2	56.0	64.5	64.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: W. Little League Dr. e/o Magnolia Av.
Lot No: 55

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	560 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,740.5 feet
Road Elevation:	1,743.0 feet
Barrier Elevation:	1,740.5 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,743.000		
Medium Trucks:	1,745.297		
Heavy Trucks:	1,751.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	41.056
Medium Trucks:	40.648
Heavy Trucks:	40.389

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-3.38	1.18	-1.20	*1.36*	-11.020	-14.020
Medium Trucks:	74.83	-20.62	1.25	-1.20	*1.04*	-10.380	-13.380
Heavy Trucks:	80.05	-24.57	1.29	-1.20	*0.42*	-8.100	-11.100

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	52.0	60.6	61.2
Medium Trucks:	54.3	52.7	46.4	44.8	53.3	53.5
Heavy Trucks:	55.6	54.1	45.1	46.4	54.7	54.8
Vehicle Noise:	63.2	61.5	58.5	53.7	62.2	62.7

Mitigated Noise Levels (with 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:	43.9	42.4	36.0	34.5	42.9	43.2
Heavy Trucks:	47.5	46.0	37.0	38.3	46.6	46.7
Vehicle Noise:	53.0	51.2	47.7	43.4	51.9	52.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: I-215 Freeway
Lot No: 79

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	149.0 feet
Centerline Dist. to Observer:	159.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,733.6 feet
Road Elevation:	1,737.0 feet
Barrier Elevation:	1,733.6 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,737.000		
Medium Trucks:	1,739.297		
Heavy Trucks:	1,745.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	154.270
Medium Trucks:	154.199
Heavy Trucks:	154.181

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-7.44	-1.20	*0.85*	-9.850	-12.850
Medium Trucks:	82.53	-8.95	-7.44	-1.20	*0.79*	-9.660	-12.660
Heavy Trucks:	85.83	-7.34	-7.44	-1.20	*0.65*	-9.150	-12.150

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.1	71.2	69.4	63.3	72.0	72.6
Medium Trucks:	64.9	63.4	57.1	55.5	64.0	64.2
Heavy Trucks:	69.8	68.4	59.4	60.6	69.0	69.1
Vehicle Noise:	75.2	73.5	70.0	65.7	74.2	74.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.2	61.3	59.6	53.5	62.1	62.7
Medium Trucks:	55.3	53.8	47.4	45.9	54.3	54.6
Heavy Trucks:	60.7	59.3	50.2	51.5	59.8	60.0
Vehicle Noise:	65.6	63.9	60.3	56.1	64.6	65.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: W. Little League Dr. e/o Driveway 2
Lot No: 79

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	640 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	31.0 feet
Centerline Dist. to Observer:	41.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,733.6 feet
Road Elevation:	1,737.0 feet
Barrier Elevation:	1,734.6 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,737.000		
Medium Trucks:	1,739.297		
Heavy Trucks:	1,745.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	42.478
Medium Trucks:	42.076
Heavy Trucks:	41.807

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-2.80	0.96	-1.20	*1.80*	-11.900	-14.900
Medium Trucks:	74.83	-20.04	1.02	-1.20	*1.44*	-11.180	-14.180
Heavy Trucks:	80.05	-23.99	1.06	-1.20	*0.70*	-9.300	-12.300

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	62.1	60.2	58.4	52.4	61.0	61.6
Medium Trucks:	54.6	53.1	46.7	45.2	53.7	53.9
Heavy Trucks:	55.9	54.5	45.5	46.7	55.1	55.2
Vehicle Noise:	63.6	61.8	58.9	54.0	62.6	63.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	50.2	48.3	46.5	40.5	49.1	49.7
Medium Trucks:	43.4	41.9	35.6	34.0	42.5	42.7
Heavy Trucks:	46.6	45.2	36.2	37.4	45.8	45.9
Vehicle Noise:	52.4	50.6	47.2	42.8	51.3	51.8

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: I-215 Freeway
Lot No: 82

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**7.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	265.0 feet
Centerline Dist. to Observer:	275.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,731.6 feet
Road Elevation:	1,731.0 feet
Barrier Elevation:	1,731.6 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,731.000		
Medium Trucks:	1,733.297		
Heavy Trucks:	1,739.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	272.195
Medium Trucks:	272.139
Heavy Trucks:	272.085

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-11.14	-1.20	*0.24*	-7.080	-10.080
Medium Trucks:	82.53	-8.95	-11.14	-1.20	*0.23*	-7.010	-10.010
Heavy Trucks:	85.83	-7.34	-11.14	-1.20	*0.18*	-6.640	-9.640

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.4	67.5	65.7	59.6	68.3	68.9
Medium Trucks:	61.2	59.7	53.4	51.8	60.3	60.5
Heavy Trucks:	66.1	64.7	55.7	56.9	65.3	65.4
Vehicle Noise:	71.5	69.8	66.3	62.0	70.5	70.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	62.3	60.4	58.6	52.6	61.2	61.8
Medium Trucks:	54.2	52.7	46.4	44.8	53.3	53.5
Heavy Trucks:	59.5	58.1	49.0	50.3	58.7	58.8
Vehicle Noise:	64.6	62.8	59.3	55.0	63.5	64.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: W. Little League Dr. e/o Driveway 2
Lot No: 82

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	640 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**7.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	145.0 feet
Centerline Dist. to Observer:	155.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,731.6 feet
Road Elevation:	1,731.0 feet
Barrier Elevation:	1,731.6 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,731.000		
Medium Trucks:	1,733.297		
Heavy Trucks:	1,739.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	155.311
Medium Trucks:	155.209
Heavy Trucks:	155.112

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-2.80	-7.49	-1.20	*0.29*	-7.430	-10.430
Medium Trucks:	74.83	-20.04	-7.48	-1.20	*0.25*	-7.150	-10.150
Heavy Trucks:	80.05	-23.99	-7.48	-1.20	*0.18*	-6.640	-9.640

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	53.6	51.7	50.0	43.9	52.5	53.1
Medium Trucks:	46.1	44.6	38.2	36.7	45.2	45.4
Heavy Trucks:	47.4	46.0	36.9	38.2	46.5	46.6
Vehicle Noise:	55.1	53.4	50.4	45.5	54.1	54.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	46.2	44.3	42.5	36.5	45.1	45.7
Medium Trucks:	39.0	37.5	31.1	29.5	38.0	38.2
Heavy Trucks:	40.7	39.3	30.3	31.5	39.9	40.0
Vehicle Noise:	47.9	46.1	43.1	38.3	46.8	47.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: Magnolia Av. n/o Driveway 1
Lot No: 3

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	230 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,757.8 feet
Road Elevation:	1,760.0 feet
Barrier Elevation:	1,757.8 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,760.000		
Medium Trucks:	1,762.297		
Heavy Trucks:	1,768.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	43.894
Medium Trucks:	43.714
Heavy Trucks:	43.942

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-5.78	0.75	-1.20	*0.17*	-6.560	-9.560
Medium Trucks:	71.09	-23.02	0.77	-1.20	*0.08*	-5.800	-8.800
Heavy Trucks:	77.24	-26.98	0.74	-1.20	*0.00*	-4.900	-7.900

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	43.5	52.1	52.7
Medium Trucks:	47.6	46.1	39.8	38.2	46.7	46.9
Heavy Trucks:	49.8	48.4	39.3	40.6	49.0	49.1
Vehicle Noise:	55.6	53.9	50.3	46.1	54.6	55.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	46.6	44.7	43.0	36.9	45.5	46.2
Medium Trucks:	41.8	40.3	34.0	32.4	40.9	41.1
Heavy Trucks:	44.9	43.5	34.4	35.7	44.1	44.2
Vehicle Noise:	49.7	48.0	44.0	40.2	48.7	49.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: Magnolia Av. n/o W. Little League Dr.
Lot No: 44

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	250 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	45.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,754.7 feet
Road Elevation:	1,755.0 feet
Barrier Elevation:	1,754.7 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,755.000		
Medium Trucks:	1,757.297		
Heavy Trucks:	1,763.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	45.157
Medium Trucks:	44.858
Heavy Trucks:	44.768

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-5.42	0.56	-1.20	*0.26*	-7.220	-10.220
Medium Trucks:	71.09	-22.66	0.60	-1.20	*0.15*	-6.400	-9.400
Heavy Trucks:	77.24	-26.61	0.62	-1.20	*0.00*	-4.900	-7.900

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	53.4	51.5	49.7	43.7	52.3	52.9
Medium Trucks:	47.8	46.3	40.0	38.4	46.9	47.1
Heavy Trucks:	50.0	48.6	39.6	40.8	49.2	49.3
Vehicle Noise:	55.8	54.1	50.5	46.3	54.8	55.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	46.2	44.3	42.5	36.4	45.1	45.7
Medium Trucks:	41.4	39.9	33.6	32.0	40.5	40.7
Heavy Trucks:	45.1	43.7	34.7	35.9	44.3	44.4
Vehicle Noise:	49.4	47.8	43.6	40.0	48.5	48.8

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: I-215 Freeway
Lot No: 50

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	150.0 feet
Centerline Dist. to Observer:	170.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,749.0 feet
Road Elevation:	1,749.0 feet
Barrier Elevation:	1,749.0 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,749.000		
Medium Trucks:	1,751.297		
Heavy Trucks:	1,757.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	165.105
Medium Trucks:	164.981
Heavy Trucks:	164.829

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-7.89	-1.20	*0.58*	-8.900	-11.900
Medium Trucks:	82.53	-8.95	-7.88	-1.20	*0.51*	-8.550	-11.550
Heavy Trucks:	85.83	-7.34	-7.87	-1.20	*0.36*	-7.800	-10.800

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.6	70.7	69.0	62.9	71.5	72.1
Medium Trucks:	64.5	63.0	56.6	55.1	63.6	63.8
Heavy Trucks:	69.4	68.0	59.0	60.2	68.6	68.7
Vehicle Noise:	74.8	73.0	69.6	65.2	73.7	74.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.7	61.8	60.1	54.0	62.6	63.2
Medium Trucks:	56.0	54.5	48.1	46.5	55.0	55.2
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	66.2	64.5	60.8	56.7	65.2	65.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: W. Little League Dr. e/o Magnolia Av.
Lot No: 50

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	560 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,749.0 feet
Road Elevation:	1,749.0 feet
Barrier Elevation:	1,749.0 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,749.000		
Medium Trucks:	1,751.297		
Heavy Trucks:	1,757.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	51.315
Medium Trucks:	50.726
Heavy Trucks:	49.993

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-3.38	-0.27	-1.20	*1.44*	-11.180	-14.180
Medium Trucks:	74.83	-20.62	-0.20	-1.20	*1.04*	-10.380	-13.380
Heavy Trucks:	80.05	-24.57	-0.10	-1.20	*0.32*	-7.600	-10.600

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.3	58.4	56.6	50.5	59.2	59.8
Medium Trucks:	52.8	51.3	44.9	43.4	51.9	52.1
Heavy Trucks:	54.2	52.8	43.7	45.0	53.3	53.4
Vehicle Noise:	61.8	60.0	57.1	52.2	60.8	61.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.1	47.2	45.4	39.4	48.0	48.6
Medium Trucks:	42.4	40.9	34.6	33.0	41.5	41.7
Heavy Trucks:	46.6	45.2	36.1	37.4	45.7	45.8
Vehicle Noise:	51.6	49.9	46.2	42.1	50.6	51.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: I-215 Freeway
Lot No: 55

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	150.0 feet
Centerline Dist. to Observer:	170.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,740.5 feet
Road Elevation:	1,743.0 feet
Barrier Elevation:	1,740.5 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,743.000		
Medium Trucks:	1,745.297		
Heavy Trucks:	1,751.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	164.971
Medium Trucks:	164.886
Heavy Trucks:	164.833

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-7.88	-1.20	*0.51*	-8.550	-11.550
Medium Trucks:	82.53	-8.95	-7.88	-1.20	*0.45*	-8.250	-11.250
Heavy Trucks:	85.83	-7.34	-7.87	-1.20	*0.31*	-7.550	-10.550

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.6	70.7	69.0	62.9	71.5	72.1
Medium Trucks:	64.5	63.0	56.6	55.1	63.6	63.8
Heavy Trucks:	69.4	68.0	59.0	60.2	68.6	68.7
Vehicle Noise:	74.8	73.0	69.6	65.2	73.7	74.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.1	62.2	60.4	54.4	63.0	63.6
Medium Trucks:	56.3	54.8	48.4	46.8	55.3	55.5
Heavy Trucks:	61.9	60.4	51.4	52.7	61.0	61.1
Vehicle Noise:	66.5	64.9	61.2	57.0	65.5	66.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: W. Little League Dr. e/o Magnolia Av.
Lot No: 55

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	560 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,740.5 feet
Road Elevation:	1,743.0 feet
Barrier Elevation:	1,740.5 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,743.000		
Medium Trucks:	1,745.297		
Heavy Trucks:	1,751.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	50.682
Medium Trucks:	50.274
Heavy Trucks:	50.015

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-3.38	-0.19	-1.20	*1.01*	-10.320	-13.320
Medium Trucks:	74.83	-20.62	-0.14	-1.20	*0.67*	-9.210	-12.210
Heavy Trucks:	80.05	-24.57	-0.11	-1.20	*0.13*	-6.240	-9.240

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.3	58.4	56.7	50.6	59.2	59.8
Medium Trucks:	52.9	51.4	45.0	43.5	51.9	52.2
Heavy Trucks:	54.2	52.7	43.7	45.0	53.3	53.4
Vehicle Noise:	61.9	60.1	57.2	52.3	60.8	61.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	50.0	48.1	46.4	40.3	48.9	49.5
Medium Trucks:	43.7	42.2	35.8	34.2	42.7	42.9
Heavy Trucks:	47.9	46.5	37.5	38.7	47.1	47.2
Vehicle Noise:	52.7	51.0	47.2	43.2	51.7	52.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: I-215 Freeway
Lot No: 79

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	149.0 feet
Centerline Dist. to Observer:	169.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,733.6 feet
Road Elevation:	1,737.0 feet
Barrier Elevation:	1,733.6 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,737.000		
Medium Trucks:	1,739.297		
Heavy Trucks:	1,745.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	163.896
Medium Trucks:	163.824
Heavy Trucks:	163.806

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-7.84	-1.20	*0.48*	-8.400	-11.400
Medium Trucks:	82.53	-8.95	-7.83	-1.20	*0.42*	-8.100	-11.100
Heavy Trucks:	85.83	-7.34	-7.83	-1.20	*0.29*	-7.430	-10.430

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.7	70.8	69.0	63.0	71.6	72.2
Medium Trucks:	64.6	63.0	56.7	55.1	63.6	63.8
Heavy Trucks:	69.5	68.0	59.0	60.2	68.6	68.7
Vehicle Noise:	74.8	73.1	69.6	65.3	73.8	74.2

Mitigated Noise Levels (with 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:	56.5	54.9	48.6	47.0	55.5	55.7
Heavy Trucks:	62.0	60.6	51.6	52.8	61.2	61.3
Vehicle Noise:	66.7	65.0	61.4	57.2	65.7	66.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: W. Little League Dr. e/o Driveway 2
Lot No: 79

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	640 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	31.0 feet
Centerline Dist. to Observer:	51.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,733.6 feet
Road Elevation:	1,737.0 feet
Barrier Elevation:	1,734.6 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,737.000		
Medium Trucks:	1,739.297		
Heavy Trucks:	1,745.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	51.913
Medium Trucks:	51.511
Heavy Trucks:	51.242

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-2.80	-0.35	-1.20	*1.26*	-10.820	-13.820
Medium Trucks:	74.83	-20.04	-0.30	-1.20	*0.89*	-9.970	-12.970
Heavy Trucks:	80.05	-23.99	-0.26	-1.20	*0.24*	-7.080	-10.080

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.8	58.9	57.1	51.0	59.7	60.3
Medium Trucks:	53.3	51.8	45.4	43.9	52.3	52.6
Heavy Trucks:	54.6	53.2	44.1	45.4	53.7	53.9
Vehicle Noise:	62.3	60.5	57.6	52.7	61.3	61.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.9	48.0	46.3	40.2	48.8	49.5
Medium Trucks:	43.3	41.8	35.5	33.9	42.4	42.6
Heavy Trucks:	47.5	46.1	37.1	38.3	46.7	46.8
Vehicle Noise:	52.5	50.8	47.1	43.0	51.5	51.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: I-215 Freeway
Lot No: 82

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**7.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	265.0 feet
Centerline Dist. to Observer:	285.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,731.6 feet
Road Elevation:	1,731.0 feet
Barrier Elevation:	1,731.6 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,731.000		
Medium Trucks:	1,733.297		
Heavy Trucks:	1,739.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	282.097
Medium Trucks:	282.040
Heavy Trucks:	281.987

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-11.37	-1.20	*0.15*	-6.400	-9.400
Medium Trucks:	82.53	-8.95	-11.37	-1.20	*0.13*	-6.240	-9.240
Heavy Trucks:	85.83	-7.34	-11.37	-1.20	*0.09*	-5.900	-8.900

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.1	67.2	65.5	59.4	68.0	68.6
Medium Trucks:	61.0	59.5	53.1	51.6	60.1	60.3
Heavy Trucks:	65.9	64.5	55.5	56.7	65.1	65.2
Vehicle Noise:	71.3	69.5	66.1	61.7	70.2	70.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	62.7	60.8	59.1	53.0	61.6	62.2
Medium Trucks:	54.8	53.3	46.9	45.4	53.8	54.1
Heavy Trucks:	60.0	58.6	49.6	50.8	59.2	59.3
Vehicle Noise:	65.0	63.3	59.8	55.5	64.0	64.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: W. Little League Dr. e/o Driveway 2
Lot No: 82

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	640 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**7.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	145.0 feet
Centerline Dist. to Observer:	165.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,731.6 feet
Road Elevation:	1,731.0 feet
Barrier Elevation:	1,731.6 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,731.000		
Medium Trucks:	1,733.297		
Heavy Trucks:	1,739.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	165.213
Medium Trucks:	165.111
Heavy Trucks:	165.014

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-2.80	-7.89	-1.20	*0.20*	-6.800	-9.800
Medium Trucks:	74.83	-20.04	-7.89	-1.20	*0.16*	-6.480	-9.480
Heavy Trucks:	80.05	-23.99	-7.88	-1.20	*0.08*	-5.800	-8.800

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:	45.7	44.2	37.8	36.3	44.8	45.0
Heavy Trucks:	47.0	45.6	36.5	37.8	46.1	46.2
Vehicle Noise:	54.7	53.0	50.0	45.1	53.7	54.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	46.4	44.5	42.8	36.7	45.3	45.9
Medium Trucks:	39.2	37.7	31.4	29.8	38.3	38.5
Heavy Trucks:	41.2	39.8	30.7	32.0	40.3	40.4
Vehicle Noise:	48.2	46.4	43.3	38.6	47.1	47.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: Magnolia Av. n/o Driveway 1
Lot No: 3

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	230 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	54.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,757.8 feet
Road Elevation:	1,760.0 feet
Barrier Elevation:	1,757.8 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,760.000		
Medium Trucks:	1,762.297		
Heavy Trucks:	1,768.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.869
Medium Trucks:	53.689
Heavy Trucks:	53.917

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-5.78	-0.59	-1.20	*0.16*	-6.480	-9.480
Medium Trucks:	71.09	-23.02	-0.57	-1.20	*0.05*	-5.500	-8.500
Heavy Trucks:	77.24	-26.98	-0.59	-1.20	*0.03*	-5.300	-8.300

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	42.2	50.8	51.4
Medium Trucks:	46.3	44.8	38.4	36.9	45.3	45.6
Heavy Trucks:	48.5	47.0	38.0	39.3	47.6	47.7
Vehicle Noise:	54.3	52.6	49.0	44.7	53.3	53.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	45.4	43.5	41.7	35.7	44.3	44.9
Medium Trucks:	40.8	39.3	32.9	31.4	39.8	40.1
Heavy Trucks:	43.2	41.7	32.7	34.0	42.3	42.4
Vehicle Noise:	48.3	46.6	42.7	38.8	47.3	47.7

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: Magnolia Av. n/o W. Little League Dr.
Lot No: 44

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	250 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,754.7 feet
Road Elevation:	1,755.0 feet
Barrier Elevation:	1,754.7 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,755.000		
Medium Trucks:	1,757.297		
Heavy Trucks:	1,763.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	55.132
Medium Trucks:	54.833
Heavy Trucks:	54.743

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-5.42	-0.74	-1.20	*0.28*	-7.360	-10.360
Medium Trucks:	71.09	-22.66	-0.70	-1.20	*0.13*	-6.240	-9.240
Heavy Trucks:	77.24	-26.61	-0.69	-1.20	*0.00*	-4.900	-7.900

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	42.4	51.0	51.6
Medium Trucks:	46.5	45.0	38.7	37.1	45.6	45.8
Heavy Trucks:	48.7	47.3	38.3	39.5	47.9	48.0
Vehicle Noise:	54.5	52.8	49.2	45.0	53.5	53.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	44.7	42.8	41.1	35.0	43.6	44.2
Medium Trucks:	40.3	38.8	32.4	30.9	39.3	39.6
Heavy Trucks:	43.8	42.4	33.4	34.6	43.0	43.1
Vehicle Noise:	48.1	46.4	42.2	38.6	47.1	47.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: I-215 Freeway
Lot No: 50

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	150.0 feet
Centerline Dist. to Observer:	170.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,749.0 feet
Road Elevation:	1,749.0 feet
Barrier Elevation:	1,749.0 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,749.000		
Medium Trucks:	1,751.297		
Heavy Trucks:	1,757.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	165.698
Medium Trucks:	165.520
Heavy Trucks:	165.214

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-7.91	-1.20	*-0.30*	0.000	0.000
Medium Trucks:	82.53	-8.95	-7.90	-1.20	*-0.36*	0.000	0.000
Heavy Trucks:	85.83	-7.34	-7.89	-1.20	*-0.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.6	70.7	68.9	62.9	71.5	72.1
Medium Trucks:	64.5	63.0	56.6	55.1	63.5	63.8
Heavy Trucks:	69.4	68.0	58.9	60.2	68.5	68.7
Vehicle Noise:	74.7	73.0	69.6	65.2	73.7	74.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.6	70.7	68.9	62.9	71.5	72.1
Medium Trucks:	64.5	63.0	56.6	55.1	63.5	63.8
Heavy Trucks:	69.4	68.0	58.9	60.2	68.5	68.7
Vehicle Noise:	74.7	73.0	69.6	65.2	73.7	74.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: W. Little League Dr. e/o Magnolia Av.
Lot No: 50

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	560 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,749.0 feet
Road Elevation:	1,749.0 feet
Barrier Elevation:	1,749.0 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,749.000		
Medium Trucks:	1,751.297		
Heavy Trucks:	1,757.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	51.535
Medium Trucks:	51.107
Heavy Trucks:	50.109

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-3.38	-0.30	-1.20	*0.01*	-5.100	-8.100
Medium Trucks:	74.83	-20.62	-0.25	-1.20	*0.00*	0.000	0.000
Heavy Trucks:	80.05	-24.57	-0.12	-1.20	*-0.27*	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:	60.2	58.3	56.6	50.5	59.1	59.7
Medium Trucks:	52.8	51.3	44.9	43.4	51.8	52.0
Heavy Trucks:	54.2	52.7	43.7	44.9	53.3	53.4
Vehicle Noise:	61.8	60.0	57.1	52.2	60.7	61.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.1	53.2	51.5	45.4	54.0	54.6
Medium Trucks:	52.8	51.3	44.9	43.4	51.8	52.0
Heavy Trucks:	54.2	52.7	43.7	44.9	53.3	53.4
Vehicle Noise:	58.9	57.3	52.9	49.4	57.9	58.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: I-215 Freeway
Lot No: 55

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	150.0 feet
Centerline Dist. to Observer:	170.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,740.5 feet
Road Elevation:	1,743.0 feet
Barrier Elevation:	1,740.5 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,743.000		
Medium Trucks:	1,745.297		
Heavy Trucks:	1,751.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	165.505
Medium Trucks:	165.362
Heavy Trucks:	165.142

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-7.90	-1.20	*-0.36*	0.000	0.000
Medium Trucks:	82.53	-8.95	-7.90	-1.20	*-0.42*	0.000	0.000
Heavy Trucks:	85.83	-7.34	-7.89	-1.20	*-0.57*	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:	72.6	70.7	68.9	62.9	71.5	72.1
Medium Trucks:	64.5	63.0	56.6	55.1	63.5	63.8
Heavy Trucks:	69.4	68.0	58.9	60.2	68.5	68.7
Vehicle Noise:	74.7	73.0	69.6	65.2	73.7	74.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.6	70.7	68.9	62.9	71.5	72.1
Medium Trucks:	64.5	63.0	56.6	55.1	63.5	63.8
Heavy Trucks:	69.4	68.0	58.9	60.2	68.5	68.7
Vehicle Noise:	74.7	73.0	69.6	65.2	73.7	74.2

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: W. Little League Dr. e/o Magnolia Av.
Lot No: 55

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	560 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,740.5 feet
Road Elevation:	1,743.0 feet
Barrier Elevation:	1,740.5 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,743.000		
Medium Trucks:	1,745.297		
Heavy Trucks:	1,751.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	50.902
Medium Trucks:	50.493
Heavy Trucks:	49.872

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-3.38	-0.22	-1.20	*0.01*	-5.100	-8.100
Medium Trucks:	74.83	-20.62	-0.17	-1.20	*0.07*	-5.700	-8.700
Heavy Trucks:	80.05	-24.57	-0.09	-1.20	*-0.52*	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:	60.3	58.4	56.6	50.6	59.2	59.8
Medium Trucks:	52.8	51.3	45.0	43.4	51.9	52.1
Heavy Trucks:	54.2	52.8	43.7	45.0	53.3	53.5
Vehicle Noise:	61.8	60.1	57.1	52.3	60.8	61.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.2	53.3	51.5	45.5	54.1	54.7
Medium Trucks:	47.1	45.6	39.3	37.7	46.2	46.4
Heavy Trucks:	54.2	52.8	43.7	45.0	53.3	53.5
Vehicle Noise:	58.1	56.4	52.4	48.6	57.1	57.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: I-215 Freeway
Lot No: 79

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	149.0 feet
Centerline Dist. to Observer:	169.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,733.6 feet
Road Elevation:	1,737.0 feet
Barrier Elevation:	1,733.6 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,737.000		
Medium Trucks:	1,739.297		
Heavy Trucks:	1,745.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	164.417
Medium Trucks:	164.285
Heavy Trucks:	164.096

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-7.86	-1.20	*-0.38*	0.000	0.000
Medium Trucks:	82.53	-8.95	-7.85	-1.20	*-0.44*	0.000	0.000
Heavy Trucks:	85.83	-7.34	-7.85	-1.20	*-0.60*	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:	72.7	70.8	69.0	62.9	71.6	72.2
Medium Trucks:	64.5	63.0	56.7	55.1	63.6	63.8
Heavy Trucks:	69.4	68.0	59.0	60.2	68.6	68.7
Vehicle Noise:	74.8	73.1	69.6	65.2	73.8	74.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.7	70.8	69.0	62.9	71.6	72.2
Medium Trucks:	64.5	63.0	56.7	55.1	63.6	63.8
Heavy Trucks:	69.4	68.0	59.0	60.2	68.6	68.7
Vehicle Noise:	74.8	73.1	69.6	65.2	73.8	74.2

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: W. Little League Dr. e/o Driveway 2
Lot No: 79

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	640 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**9.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	31.0 feet
Centerline Dist. to Observer:	51.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,733.6 feet
Road Elevation:	1,737.0 feet
Barrier Elevation:	1,734.6 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,737.000		
Medium Trucks:	1,739.297		
Heavy Trucks:	1,745.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	51.694
Medium Trucks:	51.291
Heavy Trucks:	50.821

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-2.80	-0.32	-1.20	*0.00*	-4.900	-7.900
Medium Trucks:	74.83	-20.04	-0.27	-1.20	*0.02*	-5.200	-8.200
Heavy Trucks:	80.05	-23.99	-0.21	-1.20	*-0.35*	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:	60.8	58.9	57.1	51.1	59.7	60.3
Medium Trucks:	53.3	51.8	45.5	43.9	52.4	52.6
Heavy Trucks:	54.6	53.2	44.2	45.4	53.8	53.9
Vehicle Noise:	62.3	60.6	57.6	52.7	61.3	61.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.9	54.0	52.2	46.2	54.8	55.4
Medium Trucks:	48.1	46.6	40.3	38.7	47.2	47.4
Heavy Trucks:	54.6	53.2	44.2	45.4	53.8	53.9
Vehicle Noise:	58.7	57.0	53.1	49.2	57.7	58.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: I-215 Freeway
Lot No: 82

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	81,160 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	8,116 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	81 feet

Site Data

Barrier Height:	**7.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	265.0 feet
Centerline Dist. to Observer:	285.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,731.6 feet
Road Elevation:	1,731.0 feet
Barrier Elevation:	1,731.6 feet
Road Grade:	0.0%

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%	90.87%
Medium Trucks:	84.8%	4.9%	10.3%	3.73%
Heavy Trucks:	86.5%	2.7%	10.8%	5.40%

Noise Source Elevations (in feet)

Autos:	1,731.000		
Medium Trucks:	1,733.297		
Heavy Trucks:	1,739.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	282.485
Medium Trucks:	282.376
Heavy Trucks:	282.185

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	4.92	-11.38	-1.20	*-0.90*	0.000	0.000
Medium Trucks:	82.53	-8.95	-11.38	-1.20	*-0.96*	0.000	0.000
Heavy Trucks:	85.83	-7.34	-11.38	-1.20	*-1.09*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.1	67.2	65.5	59.4	68.0	68.6
Medium Trucks:	61.0	59.5	53.1	51.6	60.1	60.3
Heavy Trucks:	65.9	64.5	55.5	56.7	65.1	65.2
Vehicle Noise:	71.3	69.5	66.1	61.7	70.2	70.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.1	67.2	65.5	59.4	68.0	68.6
Medium Trucks:	61.0	59.5	53.1	51.6	60.1	60.3
Heavy Trucks:	65.9	64.5	55.5	56.7	65.1	65.2
Vehicle Noise:	71.3	69.5	66.1	61.7	70.2	70.7

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: W. Little League Dr. e/o Driveway 2
Lot No: 82

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	640 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**7.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	145.0 feet
Centerline Dist. to Observer:	165.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,731.6 feet
Road Elevation:	1,731.0 feet
Barrier Elevation:	1,731.6 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,731.000		
Medium Trucks:	1,733.297		
Heavy Trucks:	1,739.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	165.569
Medium Trucks:	165.382
Heavy Trucks:	165.056

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-2.80	-7.90	-1.20	*-0.73*	0.000	0.000
Medium Trucks:	74.83	-20.04	-7.90	-1.20	*-0.81*	0.000	0.000
Heavy Trucks:	80.05	-23.99	-7.88	-1.20	*-1.04*	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	43.5	52.1	52.7
Medium Trucks:	45.7	44.2	37.8	36.3	44.7	45.0
Heavy Trucks:	47.0	45.5	36.5	37.8	46.1	46.2
Vehicle Noise:	54.7	53.0	50.0	45.1	53.7	54.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	53.2	51.3	49.5	43.5	52.1	52.7
Medium Trucks:	45.7	44.2	37.8	36.3	44.7	45.0
Heavy Trucks:	47.0	45.5	36.5	37.8	46.1	46.2
Vehicle Noise:	54.7	53.0	50.0	45.1	53.7	54.2

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: Magnolia Av. n/o Driveway 1
Lot No: 3

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	230 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	54.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,757.8 feet
Road Elevation:	1,760.0 feet
Barrier Elevation:	1,757.8 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,760.000		
Medium Trucks:	1,762.297		
Heavy Trucks:	1,768.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	55.048
Medium Trucks:	54.601
Heavy Trucks:	53.902

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-5.78	-0.73	-1.20	*-0.47*	0.000	0.000
Medium Trucks:	71.09	-23.02	-0.68	-1.20	*-0.73*	0.000	0.000
Heavy Trucks:	77.24	-26.98	-0.59	-1.20	*-1.63*	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:	46.2	44.7	38.3	36.8	45.2	45.5
Heavy Trucks:	48.5	47.1	38.0	39.3	47.6	47.7
Vehicle Noise:	54.2	52.5	48.9	44.6	53.2	53.6

Mitigated Noise Levels (with 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:	46.2	44.7	38.3	36.8	45.2	45.5
Heavy Trucks:	48.5	47.1	38.0	39.3	47.6	47.7
Vehicle Noise:	54.2	52.5	48.9	44.6	53.2	53.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: Magnolia Av. n/o W. Little League Dr.
Lot No: 44

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	250 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	10 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,754.7 feet
Road Elevation:	1,755.0 feet
Barrier Elevation:	1,754.7 feet
Road Grade:	0.0%

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%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,755.000		
Medium Trucks:	1,757.297		
Heavy Trucks:	1,763.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.460
Medium Trucks:	55.947
Heavy Trucks:	55.067

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-5.42	-0.89	-1.20	*-0.31*	0.000	0.000
Medium Trucks:	71.09	-22.66	-0.84	-1.20	*-0.52*	0.000	0.000
Heavy Trucks:	77.24	-26.61	-0.73	-1.20	*-1.29*	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	48.3	42.2	50.8	51.4
Medium Trucks:	46.4	44.9	38.5	37.0	45.4	45.7
Heavy Trucks:	48.7	47.3	38.2	39.5	47.8	48.0
Vehicle Noise:	54.4	52.7	49.1	44.8	53.4	53.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	51.9	50.0	48.3	42.2	50.8	51.4
Medium Trucks:	46.4	44.9	38.5	37.0	45.4	45.7
Heavy Trucks:	48.7	47.3	38.2	39.5	47.8	48.0
Vehicle Noise:	54.4	52.7	49.1	44.8	53.4	53.8

APPENDIX 10.1:

OPERATIONAL NOISE CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R3**
Source: Roof-Top Air Conditioning Units
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,168.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,168.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,758.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,750.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,758.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	53.7	51.5	50.1	78.2
Distance Attenuation	1,168.0	-47.4	-47.4	-47.4	-47.4	-47.4	-47.4
Shielding (Barrier Attenuation)	1,168.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		29.8	27.0	6.3	4.1	2.7	30.8
39 Minute Hourly Adjustment		**27.9**	**25.1**	**4.4**	**2.2**	**0.8**	**28.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R3**
Source: Loading Dock Activity
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,154.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,154.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,758.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,725.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,758.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	20.0	77.3	77.2	77.6	77.9	78.2	80.6
Distance Attenuation	1,154.0	-35.2	-35.2	-35.2	-35.2	-35.2	-35.2
Shielding (Barrier Attenuation)	1,154.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		42.1	42.0	42.4	42.7	43.0	45.4
18 Minute Hourly Adjustment		**36.9**	**36.8**	**37.2**	**37.5**	**37.8**	**40.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R4**
Source: Roof-Top Air Conditioning Units
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	444.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	444.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,740.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,750.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,740.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	53.7	51.5	50.1	78.2
Distance Attenuation	444.0	-39.0	-39.0	-39.0	-39.0	-39.0	-39.0
Shielding (Barrier Attenuation)	444.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		38.2	35.4	14.7	12.5	11.1	39.2
39 Minute Hourly Adjustment		**36.3**	**33.5**	**12.8**	**10.6**	**9.2**	**37.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R4**
Source: Shopping Cart Corral
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	690.0	feet	***Barrier Height:***	**20.0 feet**
Noise Distance to Barrier:	61.0	feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	629.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,740.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,730.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,730.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	72.9	61.9	70.3	79.5	82.7	83.4
Distance Attenuation	690.0	-42.8	-42.8	-42.8	-42.8	-42.8	-42.8
Shielding (Barrier Attenuation)	61.0	-12.5	-12.5	-12.5	-12.5	-12.5	-12.5
Raw (Distance + Barrier)		17.6	6.6	15.0	24.2	27.4	28.1
20 Minute Hourly Adjustment		**12.8**	**1.8**	**10.2**	**19.4**	**22.6**	**23.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R4**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	685.0	feet	***Barrier Height:***	**20.0**	**feet**
Noise Distance to Barrier:	51.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	634.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,740.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,730.0	feet	*Drop Off Coefficient:*	15.0	
Barrier Elevation:	1,730.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	56.7	60.7	63.7	67.1	79.5
Distance Attenuation	685.0	-32.1	-32.1	-32.1	-32.1	-32.1	-32.1
Shielding (Barrier Attenuation)	51.0	-12.4	-12.4	-12.4	-12.4	-12.4	-12.4
Raw (Distance + Barrier)		15.6	12.2	16.2	19.2	22.6	35.0
60 Minute Hourly Adjustment		**15.6**	**12.2**	**16.2**	**19.2**	**22.6**	**35.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R4**
Source: Loading Dock Activity
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	411.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	411.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,740.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,725.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,740.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	20.0	77.3	77.2	77.6	77.9	78.2	80.6
Distance Attenuation	411.0	-26.3	-26.3	-26.3	-26.3	-26.3	-26.3
Shielding (Barrier Attenuation)	411.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		51.0	50.9	51.3	51.6	51.9	54.3
18 Minute Hourly Adjustment		**45.8**	**45.7**	**46.1**	**46.4**	**46.7**	**49.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R5**
Source: Roof-Top Air Conditioning Units
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	270.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	270.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,739.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,750.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,739.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	53.7	51.5	50.1	78.2
Distance Attenuation	270.0	-34.6	-34.6	-34.6	-34.6	-34.6	-34.6
Shielding (Barrier Attenuation)	270.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		42.6	39.8	19.1	16.9	15.5	43.6
39 Minute Hourly Adjustment		**40.7**	**37.9**	**17.2**	**15.0**	**13.6**	**41.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R5**
Source: Shopping Cart Corral
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	509.0	feet	***Barrier Height:***	**20.0 feet**
Noise Distance to Barrier:	63.0	feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	446.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,739.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,730.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,730.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	72.9	61.9	70.3	79.5	82.7	83.4
Distance Attenuation	509.0	-40.2	-40.2	-40.2	-40.2	-40.2	-40.2
Shielding (Barrier Attenuation)	63.0	-12.5	-12.5	-12.5	-12.5	-12.5	-12.5
Raw (Distance + Barrier)		20.2	9.2	17.6	26.8	30.0	30.7
20 Minute Hourly Adjustment		**15.4**	**4.4**	**12.8**	**22.0**	**25.2**	**25.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R5**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	507.0	feet	***Barrier Height:***	**20.0**	**feet**
Noise Distance to Barrier:	56.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	451.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,739.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,725.0	feet	*Drop Off Coefficient:*	15.0	
Barrier Elevation:	1,730.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	56.7	60.7	63.7	67.1	79.5
Distance Attenuation	507.0	-30.1	-30.1	-30.1	-30.1	-30.1	-30.1
Shielding (Barrier Attenuation)	56.0	-13.8	-13.8	-13.8	-13.8	-13.8	-13.8
Raw (Distance + Barrier)		16.2	12.8	16.8	19.8	23.2	35.6
60 Minute Hourly Adjustment		**16.2**	**12.8**	**16.8**	**19.8**	**23.2**	**35.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R5**
Source: Loading Dock Activity
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	246.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	246.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,739.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,725.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,739.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	20.0	77.3	77.2	77.6	77.9	78.2	80.6
Distance Attenuation	246.0	-21.8	-21.8	-21.8	-21.8	-21.8	-21.8
Shielding (Barrier Attenuation)	246.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		55.5	55.4	55.8	56.1	56.4	58.8
18 Minute Hourly Adjustment		**50.3**	**50.2**	**50.6**	**50.9**	**51.2**	**53.6**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/17/2015

Observer Location: **R6**
Source: Roof-Top Air Conditioning Units
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	293.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	293.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,732.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,740.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,732.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	53.7	51.5	50.1	78.2
Distance Attenuation	293.0	-35.4	-35.4	-35.4	-35.4	-35.4	-35.4
Shielding (Barrier Attenuation)	293.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		41.8	39.0	18.3	16.1	14.7	42.8
39 Minute Hourly Adjustment		**39.9**	**37.1**	**16.4**	**14.2**	**12.8**	**40.9**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/17/2015

Observer Location: **R6**
Source: Shopping Cart Corral
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	615.0 feet	***Barrier Height:***	**20.0 feet**
Noise Distance to Barrier:	93.0 feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	522.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,732.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,730.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,725.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	72.9	61.9	70.3	79.5	82.7	83.4
Distance Attenuation	615.0	-41.8	-41.8	-41.8	-41.8	-41.8	-41.8
Shielding (Barrier Attenuation)	93.0	-9.7	-9.7	-9.7	-9.7	-9.7	-9.7
Raw (Distance + Barrier)		21.4	10.4	18.8	28.0	31.2	31.9
20 Minute Hourly Adjustment		**16.6**	**5.6**	**14.0**	**23.2**	**26.4**	**27.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R6**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	421.0	feet	***Barrier Height:***	**20.0**	**feet**
Noise Distance to Barrier:	62.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	359.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,732.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,725.0	feet	*Drop Off Coefficient:*	15.0	
Barrier Elevation:	1,725.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	56.7	60.7	63.7	67.1	79.5
Distance Attenuation	421.0	-28.9	-28.9	-28.9	-28.9	-28.9	-28.9
Shielding (Barrier Attenuation)	62.0	-11.9	-11.9	-11.9	-11.9	-11.9	-11.9
Raw (Distance + Barrier)		19.3	15.9	19.9	22.9	26.3	38.7
60 Minute Hourly Adjustment		**19.3**	**15.9**	**19.9**	**22.9**	**26.3**	**38.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R6**
Source: Loading Dock Activity
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	481.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	481.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,732.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,725.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,732.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	20.0	77.3	77.2	77.6	77.9	78.2	80.6
Distance Attenuation	481.0	-27.6	-27.6	-27.6	-27.6	-27.6	-27.6
Shielding (Barrier Attenuation)	481.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		49.7	49.6	50.0	50.3	50.6	53.0
18 Minute Hourly Adjustment		**44.5**	**44.4**	**44.8**	**45.1**	**45.4**	**47.8**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/17/2015

Observer Location: **R7**
Source: Roof-Top Air Conditioning Units
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	401.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	391.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,723.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,740.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,723.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	53.7	51.5	50.1	78.2
Distance Attenuation	401.0	-38.1	-38.1	-38.1	-38.1	-38.1	-38.1
Shielding (Barrier Attenuation)	391.0	-5.2	-5.2	-5.2	-5.2	-5.2	-5.2
Raw (Distance + Barrier)		33.9	31.1	10.4	8.2	6.8	34.9
39 Minute Hourly Adjustment		**32.0**	**29.2**	**8.5**	**6.3**	**4.9**	**33.0**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/17/2015

Observer Location: **R7**
Source: Shopping Cart Corral
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,044.0	feet	***Barrier Height:***	**20.0 feet**
Noise Distance to Barrier:	281.0	feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	763.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,723.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,730.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,725.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	72.9	61.9	70.3	79.5	82.7	83.4
Distance Attenuation	1,044.0	-46.4	-46.4	-46.4	-46.4	-46.4	-46.4
Shielding (Barrier Attenuation)	281.0	-8.1	-8.1	-8.1	-8.1	-8.1	-8.1
Raw (Distance + Barrier)		18.4	7.4	15.8	25.0	28.2	28.9
20 Minute Hourly Adjustment		**13.6**	**2.6**	**11.0**	**20.2**	**23.4**	**24.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R7**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	587.0	feet	***Barrier Height:***	**20.0**	**feet**
Noise Distance to Barrier:	103.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	484.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,723.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,720.0	feet	*Drop Off Coefficient:*	15.0	
Barrier Elevation:	1,720.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	56.7	60.7	63.7	67.1	79.5
Distance Attenuation	587.0	-31.0	-31.0	-31.0	-31.0	-31.0	-31.0
Shielding (Barrier Attenuation)	103.0	-10.7	-10.7	-10.7	-10.7	-10.7	-10.7
Raw (Distance + Barrier)		18.4	15.0	19.0	22.0	25.4	37.8
60 Minute Hourly Adjustment		**18.4**	**15.0**	**19.0**	**22.0**	**25.4**	**37.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R7**
Source: Loading Dock Activity
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,000.0	feet	***Barrier Height:***	**6.0**	**feet**
Noise Distance to Barrier:	990.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,723.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,725.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,723.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	20.0	77.3	77.2	77.6	77.9	78.2	80.6
Distance Attenuation	1,000.0	-34.0	-34.0	-34.0	-34.0	-34.0	-34.0
Shielding (Barrier Attenuation)	990.0	-5.4	-5.4	-5.4	-5.4	-5.4	-5.4
Raw (Distance + Barrier)		37.9	37.8	38.2	38.5	38.8	41.2
18 Minute Hourly Adjustment		**32.7**	**32.6**	**33.0**	**33.3**	**33.6**	**36.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R8**
Source: Shopping Cart Corral
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,574.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,564.0	feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,759.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,730.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,759.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	72.9	61.9	70.3	79.5	82.7	83.4
Distance Attenuation	1,574.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Shielding (Barrier Attenuation)	1,564.0	-5.7	-5.7	-5.7	-5.7	-5.7	-5.7
Raw (Distance + Barrier)		17.2	6.2	14.6	23.8	27.0	27.7
20 Minute Hourly Adjustment		**12.4**	**1.4**	**9.8**	**19.0**	**22.2**	**22.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/17/2015

Observer Location: **R8**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Rancho Palma
Job Number: 9785
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,461.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,451.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,759.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,730.0	feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	1,759.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	56.7	60.7	63.7	67.1	79.5
Distance Attenuation	1,461.0	-37.0	-37.0	-37.0	-37.0	-37.0	-37.0
Shielding (Barrier Attenuation)	1,451.0	-5.7	-5.7	-5.7	-5.7	-5.7	-5.7
Raw (Distance + Barrier)		17.4	14.0	18.0	21.0	24.4	36.8
60 Minute Hourly Adjustment		**17.4**	**14.0**	**18.0**	**21.0**	**24.4**	**36.8**

APPENDIX 11.1:

CONSTRUCTION REFERENCE NOISE LEVEL MEASUREMENTS MEMO

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URBAN CROSSROADS
41 Corporate Park | Suite 300 | Irvine, CA 92606 | (949) 660-1994
www.urbanXroads.com

SUBJECT: CONSTRUCTION REFERENCE NOISE LEVEL MEASUREMENTS MEMO

This Construction Reference Noise Level Measurements Memo has been prepared to summarize the sample reference noise level measurements collected by Urban Crossroads, Inc. To describe peak construction noise activities, we have historically relied on reference noise level measurements provided in the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM). However, our experience demonstrates that the RCNM significantly overstates the predicted construction noise levels. This is largely due the fact that RCNM is based on construction equipment data collected from the Central Artery/Tunnel project in Boston, Massachusetts in the early 1990's. Due to substantial changes in the air quality emission requirements in the State of California Air Resources Board (ARB), the RCNM reference noise level measurements do not adequately describe modern construction equipment noise levels. In addition, the RCNM methodology places all construction equipment at a single point near the property line. This scenario simply does not occur in the real world as typical construction activity represents a variety of equipment operating at different locations throughout the project site.

REFERENCE NOISE LEVEL MEASUREMENTS

To estimate a project's construction-related noise levels, sample reference noise level measurements of similar construction activities were collected by Urban Crossroads, Inc. to describe the different stages of construction. The reference noise levels are intended to represent typical construction noise levels when multiple pieces of equipment are operating simultaneously at a construction site. The following reference noise level measurements were collected from existing construction operations with similar equipment as those expected with future construction of comparable land uses. Appendix A includes the data collected from each of the reference noise level measurements adjusted to present noise levels at a uniform reference distance of 50 feet. Appendix B includes the reference noise source photos by identification number ("ID"). Table 1 summarizes the reference noise level measurements. The reference noise level measurements are identified by land use type and location below.

BUSINESS PARK CONSTRUCTION SITE, CITY OF IRVINE

On Wednesday, October 14th, 2015, Urban Crossroads, Inc. collected short-term construction noise level measurements at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine. The reference noise level measurements include the following noise source activities: a truck pass-by and background dozer activity (ID 1) and dozer activity (ID 2). Both measurements were taken at a distance of approximately 30 feet from the source and represent typical construction activities during the grading stage of construction.

RESIDENTIAL CONSTRUCTION SITE, CITY OF RANCHO MISSION VIEJO

On Tuesday, October 20th, 2015, Urban Crossroads, Inc. collected short-term construction noise level measurements at a residential construction site located in the unincorporated area within the County of Orange known as Rancho Mission Viejo. The reference noise level measurements include the following noise source activities: construction vehicle maintenance (ID 3), foundation trenching (ID 4), rough grading activities (ID 5), and residential building framing (ID 6). All reference measurements were taken at this location at a distance of approximately 30 feet from the noise source.

INDUSTRIAL SITE, CITY OF ONTARIO

Additional short-term reference noise level measurements were collected on Friday, October 30th, 2015, by Urban Crossroads, Inc. at an active industrial construction site in the City of Ontario. The reference noise level measurements represent the grading activities associated with industrial/warehousing construction. Five reference noise level measurements were taken at this location to describe: a water truck pass-by and backup alarm (ID 7), a dozer pass-by (ID 8), two scrapers and a water truck pass-by (ID 9), two scrapers pass-by (ID 10), and scraper, water truck and dozer activities over a 30-minute period (ID 11). All reference measurements taken at this location were at a distance of approximately 30 feet from the source.

INDUSTRIAL SITE, CITY OF REDLANDS

On July 1st, 2015, Urban Crossroads, Inc. collected short-term construction noise level measurements of a nighttime concrete pour at an industrial construction site located at 27334 San Bernardino Avenue in the City of Redlands. The reference noise level measurements include the following nighttime building construction and paving-related noise source activities: concrete mixer truck movements (ID 12), concrete paver activities (ID 13), concrete mixer pour & paving activities (ID 14), concrete mixer backup alarms and air brakes (ID 15), and a one-hour measurement over the duration of all reference measurements at this location of concrete mixer pour activities (ID 16).

TABLE 1: CONSTRUCTION REFERENCE NOISE LEVEL MEASUREMENTS SUMMARY

ID	Noise Source	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance		Reference Noise Levels @ 50 Feet[6]	
			dBA Leq	dBA Lmax	dBA Leq	dBA Lmax
1	Truck Pass-Bys & Dozer Activity[1]	30'	63.6	68.1	59.2	63.7
2	Dozer Activity[1]	30'	68.6	76.4	64.2	72.0
3	Construction Vehicle Maintenance Activities[2]	30'	71.9	74.8	67.5	70.4
4	Foundation Trenching[2]	30'	72.6	74.9	68.2	70.5
5	Rough Grading Activities[2]	30'	77.9	84.8	73.5	80.4
6	Residential Framing[3]	30'	66.7	76.7	62.3	72.3
7	Water Truck Pass-By & Backup Alarm[4]	30'	76.3	82.3	71.9	77.9
8	Dozer Pass-By[4]	30'	84.0	89.9	79.6	85.5
9	Two Scrapers & Water Truck Pass-By[4]	30'	83.4	89.0	79.0	84.6
10	Two Scrapers Pass-By[4]	30'	83.7	86.9	79.3	82.5
11	Scraper, Water Truck, & Dozer Activity[4]	30'	79.7	87.7	75.3	83.3
12	Concrete Mixer Truck Movements[5]	50'	71.2	73.1	71.2	73.1
13	Concrete Paver Activities[5]	30'	70.0	75.7	65.6	71.3
14	Concrete Mixer Pour & Paving Activities[5]	30'	70.3	76.3	65.9	71.9
15	Concrete Mixer Backup Alarms & Air Brakes[5]	50'	71.6	78.8	71.6	78.8
16	Concrete Mixer Pour Activities[5]	50'	67.7	79.2	67.7	79.2

[1] As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.
[2] As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.
[3] As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.
[4] As measured by Urban Crossroads, Inc. on 10/30/15 during grading operations within an industrial construction site located in the City of Ontario.
[5] Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.
[6] Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

MODELED AND MEASURED CONSTRUCTION NOISE LEVELS

A RCNM construction noise analysis was prepared by Urban Crossroads, Inc. on October 17th, 2014 for an industrial project site in the City of Ontario. The noise levels due to construction in the industrial portion of the project site (Planning Area 1) were estimated at up to thirteen receiver locations to determine the potential noise impacts at adjacent sensitive land uses. Returning to the same industrial project site over a year later, in October 2015, Urban Crossroads, Inc. collected noise level measurements at the same receiver locations to validate the modeled RCNM construction noise levels with actual construction noise level measurements collected in the field. The grading stage of construction was chosen for this comparison since grading activities typically represent the worst-case construction activities due to the number and size of the mobile equipment used in the grading process.

MODELED CONSTRUCTION NOISE LEVELS

As shown on Table 2, the modeled RCNM noise levels during the grading stage of construction were estimated to produce a noise level approaching 92.6 dBA Leq at a distance of 50 feet from the project site boundary. The RCNM noise levels reflect the combined construction noise level impacts of excavators, graders, tractors, loaders, backhoes, rubber tired dozers, and scrapers producing a noise level of 92.6 dBA Leq. At nearby receiver locations, this results in a short-term construction noise level approaching 88.2 dBA Leq.

TABLE 2: RCNM MODELED CONSTRUCTION NOISE LEVELS

Equipment Type[1]	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (dBA Leq)	Combined Level @ 50 Feet (dBA Leq)
Excavator	2	40%	3.2	81.0	80.0
Grader	8	40%	3.2	85.0	90.1
Tractor/Loader/Backhoe	5	40%	3.2	78.0	81.0
Rubber Tired Dozer	2	40%	3.2	79.0	78.0
Scraper	5	40%	3.2	84.0	87.0
Combined Hourly Noise Levels 50 Feet (Leq dBA)					92.6

Receiver Location	Distance To Property Line (Feet)[4]	Distance Attenuation (dBA Leq)[5]	Estimated Noise Barrier Attenuation (dBA Leq)	Construction Noise Level (dBA Leq)
R2	83'	-4.4	0.0	88.2
R3	78'	-3.9	-5.6	83.1

[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] Distance from the nearest point of construction activity to the nearest receiver.
[5] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

MEASURED CONSTRUCTION NOISE LEVELS

To describe the actual construction noise levels based on typical conditions, short-term construction noise level measurements were collected in the field during grading activities at receiver locations R2 and R3. Appendix C includes study area photos of the measurement locations and the construction activities observed from each location at the project site. To validate the construction noise levels, measurements were collected during continuous on-site grading activities on Friday, October 30th, and again on Friday, November 6th, 2015.

Grading activities observed on the site during the short-term noise level measurements include water trucks queuing and refilling at a stationary tank, trencher activity, up to three scrapers operating simultaneously, and dozer activity. The water truck queuing activity was the closest equipment observed near the project site boundaries due to the stationary location of the water refill tank, at a distance of approximately 100 feet from the receiver locations. The trencher was observed at a distance of roughly 600 feet from the receiver locations, and the scrapers and dozer activities were at approximately 900 feet from the receiver locations. Additional stationary scrapers were located at a distance of approximately 700 feet from the receiver locations. Additional background construction noise sources include forklifts, cranes, and man lifts used in the building construction stage of a portion of the site located roughly 900 feet southeast of the receiver locations. The construction activities observed during the short-term measurements represent typical grading activities within an industrial construction site, with multiple pieces of equipment operating at varying distances from the project site boundaries.

Table 3 shows the modeled RCNM noise levels using the actual distances from each receiver location to the nearest equipment activity observed during the short-term noise level measurements. Based on the RCNM model, the peak grading construction noise levels would range from 80.9 to 86.5 dBA Leq when equipment is located at 100 feet from each receiver location. By calculating the modeled RCNM noise level at each location, a comparison can be made between the modeled and measured grading construction noise levels to calibrate the construction noise model.

TABLE 3: MODELED CONSTRUCTION NOISE LEVELS BASED ON ACTUAL EQUIPMENT DISTANCES

Equipment Type[1]	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (dBA Leq)	Combined Level @ 50 Feet (dBA Leq)
Excavator	2	40%	3.2	81.0	80.0
Grader	8	40%	3.2	85.0	90.1
Tractor/Loader/Backhoe	5	40%	3.2	78.0	81.0
Rubber Tired Dozer	2	40%	3.2	79.0	78.0
Scraper	5	40%	3.2	84.0	87.0
Combined Hourly Noise Levels 50 Feet (Leq dBA)					92.6

Receiver Location	Distance To Closest Equipment Activity (Feet)[4]	Distance Attenuation (dBA Leq)[5]	Estimated Noise Barrier Attenuation (dBA Leq)	Construction Noise Level (dBA Leq)
R2	100'	-6.0	0.0	86.5
R3	100'	-6.0	-5.6	80.9

[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] Distance from the nearest point of construction activity to the nearest receiver.
[5] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

To determine the project-only construction noise levels at each receiver location during the grading activities observed at the project site, the ambient without project noise level measurements are compared to the short-term with project noise level measurements. The ambient noise level measurements from the original noise study are shown on Table 4 in addition to the new short-term noise level measurements collected during typical grading activity at the receiver locations on Day 1, Friday, October 30th 2015. By subtracting the previous ambient noise level from the new combined (project construction plus ambient) noise level measurements at each receiver, the project-only construction noise levels can be logarithmically calculated. Table 4 shows the project-only construction noise levels ranged from 61.4 to 63.4 dBA Leq, and are significantly lower than those modeled with the RCNM at the same receiver locations.

Based on the Day 1 analysis, the differences between the peak RCNM model and typical measured construction noise levels range from 19.6 to 23.2 dBA Leq. This analysis demonstrates how the RCNM overstates the potential construction noise level impacts by placing all equipment at a single point at the project site boundary. In reality, the grading equipment within the project site was observed to operate in different locations throughout the project site. . In addition, the typical construction noise levels

measured at the receiver locations reflect modern construction equipment noise level emissions that are largely overstated using the older RCNM reference noise levels.

TABLE 4: DAY 1 CONSTRUCTION NOISE LEVEL COMPARISON

Original Noise Study			Calibration			
Receiver Location[1]	Measured Daytime Ambient Noise Levels (dBA Leq)[2]	Peak Modeled RCNM Grading Construction Noise Levels (dBA Leq)[3]	Calculated RCNM Noise Levels to Closest Observed Equipment (dBA Leq)[4]	Measured Typical Grading Construction Noise Levels at Receivers (dBA Leq)[5]	Calculated Project-Only Construction Noise Levels (dBA Leq)[6]	Difference Between Modeled & Measured Noise Levels (dBA Leq)[7]
R2	70.3	88.2	86.5	71.1	63.4	23.2
R3	68.3	83.1	80.9	69.1	61.4	19.6

[1] Receiver locations from the construction noise analysis which are closest to the Planning Area 1 construction activities.
[2] Ambient noise level measurements taken on 3/13/14 at the receiver locations during the Ontario industrial project noise study.
[3] Estimated construction noise levels based on the RCNM peak construction noise analysis methodology. These conditions are not likely to occur as the RCNM assumes all equipment is operating simultaneously at a single point at the project site boundary.
[4] Modeled RCNM construction noise levels at each receiver location based on the observed distance to the nearest construction equipment activity during the noise level measurements, shown on Table 3.
[5] Measured noise levels at the receiver locations during one hour of typical grading activities in the center of the construction site.
[6] Project only construction noise levels calculated based on the logarithmic noise level difference between the measured noise levels during grading activity and the ambient without project noise levels measured at each receiver location.
[7] Difference between the peak RCNM modeled noise levels and the typical noise levels measured at the receiver locations during typical grading activities.

Similarly, the Day 2 short-term construction noise level measurements are shown on Table 5 in relation to the RCNM modeled noise levels. Table 5 shows the project-only construction noise levels ranged from 64.1 to 65.3 dBA Leq, and are significantly lower than those modeled with the RCNM at the same receiver locations. Based on the Day 2 analysis, the differences between the peak RCNM model and typical measured construction noise levels range from 16.8 to 21.2 dBA Leq. This Day 2 analysis is consistent with the Day 1 typical grading construction noise level measurements taken a week later at the same receiver locations.

TABLE 5: DAY 2 CONSTRUCTION NOISE LEVEL COMPARISON

Original Noise Study			Calibration			
Receiver Location[1]	Measured Daytime Ambient Noise Levels (dBA Leq)[2]	Peak Modeled RCNM Grading Construction Noise Levels (dBA Leq)[3]	Calculated RCNM Noise Levels to Closest Observed Equipment (dBA Leq)[4]	Measured Typical Grading Construction Noise Levels at Receivers (dBA Leq)[5]	Calculated Project-Only Construction Noise Levels (dBA Leq)[6]	Difference Between Modeled & Measured Noise Levels (dBA Leq)[7]
R2	70.3	88.2	86.5	71.5	65.3	21.2
R3	68.3	83.1	80.9	69.7	64.1	16.8

[1] Receiver locations from the construction noise analysis which are closest to the Planning Area 1 construction activities.
[2] Ambient noise level measurements taken on 3/13/14 at the receiver locations during the Ontario industrial project noise study.
[3] Estimated construction noise levels based on the RCNM peak construction noise analysis methodology. These conditions are not likely to occur as the RCNM assumes all equipment is operating simultaneously at a single point at the project site boundary.
[4] Modeled RCNM construction noise levels at each receiver location based on the observed distance to the nearest construction equipment activity during the noise level measurements, shown on Table 3.
[5] Measured noise levels at the receiver locations during one hour of typical grading activities in the center of the construction site.
[6] Project only construction noise levels calculated based on the logarithmic noise level difference between the measured noise levels during grading activity and the ambient without project noise levels measured at each receiver location.
[7] Difference between the peak RCNM modeled noise levels and the typical noise levels measured at the receiver locations during typical grading activities.

CONCLUSIONS

The sample reference noise level measurements were taken by Urban Crossroads, Inc. in order to better describe the noise levels from various typical construction activities at different land use types. To quantify the difference between the modeled RCNM and measured construction noise levels in the field, Urban Crossroads, Inc. compared the modeled results of a RCNM construction noise level analysis with the actual measured noise levels observed in the field during typical grading activities at the same project site. While the RCNM equipment database and methodology provides conservative, worst-case, construction noise levels for specific pieces of equipment, our field measurements show how the RCNM methodology overstates the noise levels experienced at the nearby receiver locations during actual construction activities.

This analysis demonstrates how the RCNM overstates the potential construction noise level impacts by placing all equipment at a single point at the project site boundary. In reality based on our observations in the field, the grading equipment within the project site was observed to operate at different locations throughout the project site. In addition, the typical construction noise levels measured at the receiver locations reflect modern construction equipment noise level emissions that are largely overstated using the older RCNM reference noise levels. The reference noise level measurements presented in this memo are, therefore, representative of typical construction noise levels to accurately describe potential construction noise impacts at nearby receiver locations for a given project. This memo presents typical construction activity reference noise levels. Detailed site specific analysis is needed to assess potential

construction noise level impacts at nearby sensitive receiver locations on a project by project basis and to identify the appropriate mitigation measures as needed at future construction sites.

Prepared by:

URBAN CROSSROADS, INC.

Bill Lawson, P.E., INCE
Principal

Alex Wolfe
Assistant Analyst

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APPENDIX A

REFERENCE NOISE LEVEL MEASUREMENTS SUMMARY TABLE

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Appendix A

Construction Equipment Reference Noise Levels

ID	Reference Source	Type of Project (Land Use)	Typical Construction Stage(s)	Reference Measurement Duration (h:mm:ss)	Reference Distance From Source (Feet)	Reference Noise Levels		Reference Noise Levels @ 50 Feet	
						dBA Leq	dBA Lmax	dBA Leq	dBA Lmax
1	Truck Pass-Bys & Dozer Activity	Business Park	Grading	0:01:15	30'	63.6	68.1	59.2	63.7
2	Dozer Activity	Business Park	Grading	0:01:00	30'	68.6	76.4	64.2	72.0
3	Construction Vehicle Maintenance Activities	Residential	Grading	0:01:00	30'	71.9	74.8	67.5	70.4
4	Foundation Trenching	Residential	Trenching, Building Const.	0:01:01	30'	72.6	74.9	68.2	70.5
5	Rough Grading Activities	Residential	Grading	0:05:00	30'	77.9	84.8	73.5	80.4
6	Residential Framing	Residential	Building Const.	0:02:00	30'	66.7	76.7	62.3	72.3
7	Water Truck Pass-By & Backup Alarm	Industrial	Grading	0:00:45	30'	76.3	82.3	71.9	77.9
8	Dozer Pass-By	Industrial	Grading	0:00:32	30'	84.0	89.9	79.6	85.5
9	Two Scrapers & Water Truck Pass-By	Industrial	Grading	0:00:32	30'	83.4	89.0	79.0	84.6
10	Two Scrapers Pass-By	Industrial	Grading	0:00:30	30'	83.7	86.9	79.3	82.5
11	Scraper, Water Truck, & Dozer Activity	Industrial	Grading	0:30:00	30'	79.7	87.7	75.3	83.3
12	Concrete Mixer Truck Movements	Industrial	Building Const., Paving	0:01:00	50'	71.2	*73.1*	71.2	73.1
13	Concrete Paver Activities	Industrial	Building Const., Paving	0:01:00	30'	70.0	*75.7*	65.6	71.3
14	Concrete Mixer Pour & Paving Activities	Industrial	Building Const., Paving	0:01:00	30'	70.3	*76.3*	65.9	71.9
15	Concrete Mixer Backup Alarms & Air Brakes	Industrial	Building Const., Paving	0:00:20	50'	71.6	*78.8*	71.6	78.8
16	Concrete Mixer Pour Activities	Industrial	Building Const., Paving	1:00:00	50'	67.7	79.2	67.7	79.2

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APPENDIX B

REFERENCE NOISE SOURCE PHOTOS

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Construction Reference Noise Source Photos

1.1_TruckPass-By&DozerActivity
33, 39' 0.101600", 117, 43' 56.773600"

2.1_DozerActivity
33, 39' 0.101600", 117, 43' 56.773600"

3.1_ConstructionVehicleMaintenance
33, 31' 16.600000", 117, 36' 58.060000"

4.1_FoundationTrenching
33, 32' 8.530000", 117, 35' 55.490000"

4.2_FoundationTrenching
33, 32' 8.540000", 117, 35' 55.710000"

5.1_RoughGradingActivities
33, 31' 16.710000", 117, 37' 0.530000"

Construction Reference Noise Source Photos

5.2_RoughGradingActivities
33, 31' 16.600000", 117, 37' 0.450000"

5.3_RoughGradingActivities
33, 31' 16.570000", 117, 37' 0.450000"

5.4_RoughGradingActivities
33, 31' 16.660000", 117, 37' 0.310000"

6.1_ResidentialFraming
33, 32' 15.610000", 117, 36' 2.740000"

7.1_WaterTruckPassBy&BackupAlarm
34, 4' 19.318500", 117, 36' 25.015800"

8.1_DozerPass-By
34, 4' 19.373400", 117, 36' 24.988400"

Construction Reference Noise Source Photos

9.1_TwoScrapers&WaterTruckPass-By
34, 4' 19.332200", 117, 36' 24.988400"

10.1_TwoScrapersPass-By
34, 4' 19.373400", 117, 36' 25.070800"

10.2_TwoScrapersPass-By
34, 4' 19.373400", 117, 36' 25.070800"

11.1_Scraper,WaterTruck,&DozerActivity
34, 4' 19.373400", 117, 36' 25.070800"

11.2_Scraper,WaterTruck,&DozerActivity
34, 4' 19.318500", 117, 36' 25.125700"

11.3_Scraper,WaterTruck,&DozerActivity
34, 4' 19.346000", 117, 36' 25.043300"

Construction Reference Noise Source Photos

11.4_Scraper,WaterTruck,&DozerActivity
34, 4' 19.291000", 117, 36' 25.070800"

12.1_ConcreteMixerTruckMovements
34, 4' 43.200000", 117, 12' 25.779400"

13.1_ConcretePaverActivities
34, 4' 43.625700", 117, 12' 25.312500"

14.1_ConcreteMixerPour&PavingActivities
34, 4' 42.746800", 117, 12' 24.955400"

15.1_ConcreteMixerBackupAlarms&AirBrakes
34, 4' 43.666900", 117, 12' 24.763100"

16.1_ConcreteMixerPourActivities
34, 4' 43.158800", 117, 12' 25.944200"

APPENDIX C

SHORT-TERM MEASUREMENTS & CONSTRUCTION ACTIVITY PHOTOS

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ConstructionSite_1
34, 4' 39.808000", 117, 36' 22.955900"

ConstructionSite_2
34, 4' 39.808000", 117, 36' 22.955900"

ConstructionSite_3
34, 4' 39.533300", 117, 36' 23.312900"

ConstructionSite_4
34, 4' 39.533300", 117, 36' 23.312900"

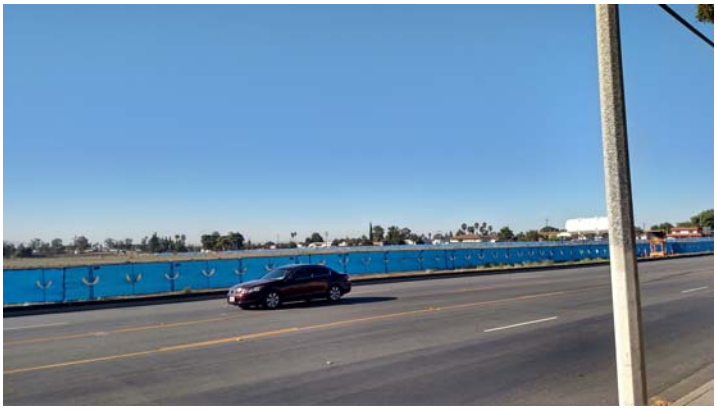
ConstructionSite_5
34, 4' 39.341100", 117, 36' 28.064500"

ConstructionSite_6
34, 4' 39.684400", 117, 36' 23.477700"

ConstructionSite_7
34, 4' 39.684400", 117, 36' 23.477700"

R2
34, 4' 39.341100", 117, 36' 28.064500"

R2_South
34, 4' 39.217500", 117, 36' 29.108200"

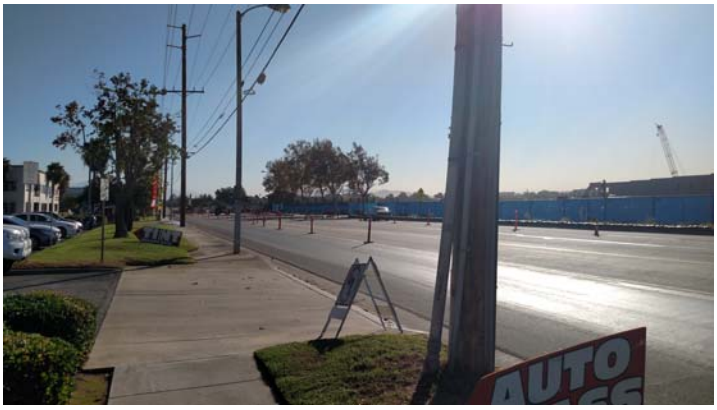


R2_Southwest
34, 4' 39.217500", 117, 36' 29.108200"

R2_Southwest2
34, 4' 39.505900", 117, 36' 28.970900"

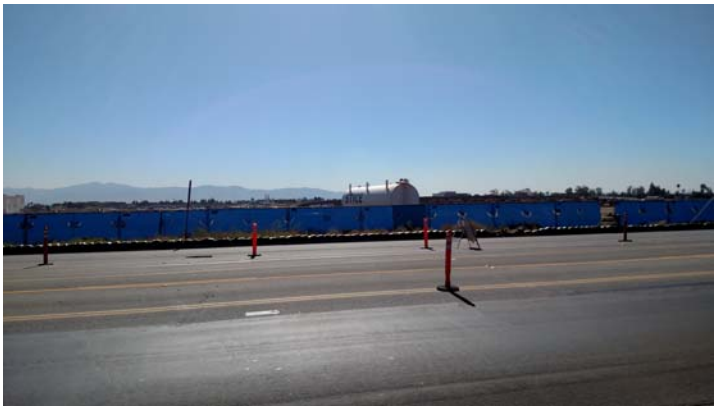
R2_West
34, 4' 39.217500", 117, 36' 29.108200"

R3
34, 4' 39.972800", 117, 36' 16.803500"

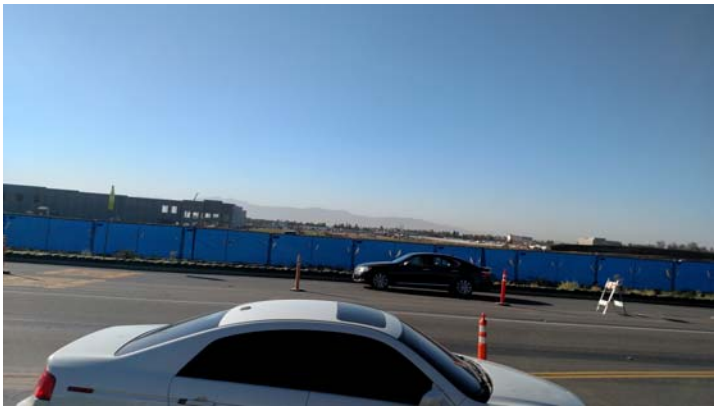


R3_E
34, 4' 39.972800", 117, 36' 16.803500"

R3_South
34, 4' 39.972800", 117, 36' 16.803500"



R3_South2
34, 4' 39.519600", 117, 36' 17.050700"



R3_South3
34, 4' 39.698100", 117, 36' 14.221800"

R3_Southeast
34, 4' 39.698100", 117, 36' 14.221800"

R3_Southwest
34, 4' 39.972800", 117, 36' 16.803500"