Orange Show Logistics Center

NOISE IMPACT ANALYSIS

CITY OF SAN BERNARDINO

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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
Hz	Hertz
I-10	Interstate 10
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
OPR	Office of Planning and Research
PCE	Passenger Car Equivalent
PPV	Peak particle velocity
Project	Orange Show Logistics Center
RCNM	Roadway Construction Noise Model
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
SBIA	San Bernardino International Airport
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 Orange Show Logistics Center development ("Project"). The Project site is located on the northwest corner of South Lena Road and Orange Show Road in the City of San Bernardino. The Project is proposed to consist of approximately 342,000 square feet of high-cube warehouse/warehousing 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 13 roadway segments surrounding the Project site were calculated 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 *Orange Show Logistics Center 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 Growth (EA) 2017, EA plus Cumulative (EAC) 2017, and Horizon Year 2040 traffic conditions.

The land uses adjacent to the study area roadways conveying Project traffic consist mostly of non-noise-sensitive industrial designated land uses, as indicated on Figure LU-2 of the City of San Bernardino General Plan Land Use Element, however, some non-conforming residential land uses exist on roadway segments such as Orange Show Road west of Waterman Avenue and east of Lena Road, among others. Therefore, both noise-sensitive and non-noise-sensitive significance criteria are applied to the study area roadway segments in this noise study. Using the significance criteria for noise-sensitive and non-noise-sensitive land uses, the off-site traffic noise analysis shows that the Project's contributions to roadway noise levels at adjacent land uses will be *less than significant* under the Existing with Project, Existing plus Ambient Growth (EA) with Project 2017, EA plus Cumulative (EAC) with Project 2017, and Horizon Year 2040 with Project conditions.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected noise sources from the Orange Show Logistics Center site, this analysis estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. The normal activities associated with the proposed Orange Show Logistics Center are anticipated to include idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods. The operational noise analysis shows that the Project-related stationary-source noise levels due to the idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods will satisfy the City of San Bernardino Municipal Code noise level standards at the sensitive receiver locations near 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 24-hour seven days per week Project activities, such as the idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods, will be *less than significant*.

OPERATIONAL NOISE ABATEMENT MEASURES

The normal operation of the Project will not exceed the City of San Bernardino Development Code standards for stationary-source noise impacts. To further reduce potential operational noise levels received at nearby noise-sensitive receiver locations, it is recommended that the Lead Agency require the following as Project Conditions of Approval:

- All on-site operating equipment under the control of the building user that is used in outdoor areas (including but not limited to trucks, tractors, forklifts, and hostlers), shall be operated with properly functioning and well-maintained mufflers.
- Maintain quality pavement conditions on the property that are free of vertical deflection (i.e. speed bumps) to minimize truck noise.
- The truck access gates and loading docks within the truck court on the Project site shall be posted with signs which state:
    - Truck drivers shall turn off engines when not in use;
    - Diesel trucks servicing the Project shall not idle for more than five (5) minutes; and
    - Post telephone numbers of the building facilities manager to report idling violations.

CONSTRUCTION NOISE AND VIBRATION 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 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 in RMS are expected to approach 0.113 in/sec (RMS) at the twelve receiver locations. Based on the City of San Bernardino vibration standards of 1.5 in/sec (RMS), the proposed Project construction activities will be *less than significant.*

CONSTRUCTION NOISE AND VIBRATION ABATEMENT MEASURES

Construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts. The following practices would reduce any temporary and intermittent noise level increases produced by the construction equipment audible to the nearby noise-sensitive residential land uses. Prior to approval of grading plans and/or issuance of building permits, plans shall include the following notes. The Project construction supervisor shall ensure compliance with the notes and the City shall conduct periodic inspection at its discretion.

- Noise-generating Project construction activities shall only occur between the hours of 7:00 a.m. and 8:00 p.m. on any day, as specified in the City of San Bernardino Noise Ordinance.
- The construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards.
- No stationary construction equipment shall be placed within 500 feet of residential homes and other noise-sensitive receivers. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise-sensitive receivers nearest the Project site.
- The construction contractor shall locate equipment staging in the southern central portion of the property, which is the area that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site.
- The construction contractor shall schedule haul truck deliveries to occur during the same hours specified for construction equipment (between the hours of 7:00 a.m. and 8:00 p.m. on any day) and design haul truck delivery routes to minimize the use of roads that pass by noise-sensitive land uses.
- The solid perimeter walls proposed at the north, east, and west property boundaries shall be erected as early in the construction process as feasible. (Once erected these walls will act as noise attenuation barriers.)

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1 INTRODUCTION

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

1.1 SITE LOCATION

The proposed Orange Show Logistics Center site is located on the northwest corner of South Lena Road and Orange Show Road in the City of San Bernardino, as shown on Exhibit 1-A. Existing residential land uses are located north, west, and east of the Project site. South of the Project site across Orange Show Road is the Alliance California Gateway South industrial development which is currently under construction. Existing light industrial land use in the Project study is located adjacent to the western Project site boundary. A vacant lot located north of the Project site is designated as industrial light land use. The Interstate 10 (I-10) Freeway is located approximately 1.25 miles south of the Project site, and the Interstate 215 (I-215) Freeway is located roughly 1.25 miles west of the Project site. In addition, the San Bernardino International Airport (SBIA) is located approximately 1.25 miles northeast of the Project site.

1.2 PROJECT DESCRIPTION

The Project is proposed to consist of approximately 342,000 square feet of high-cube warehouse/warehousing use, as shown on Exhibit 1-B. At the time this noise analysis was prepared the future tenants of the proposed Project were unknown. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week.

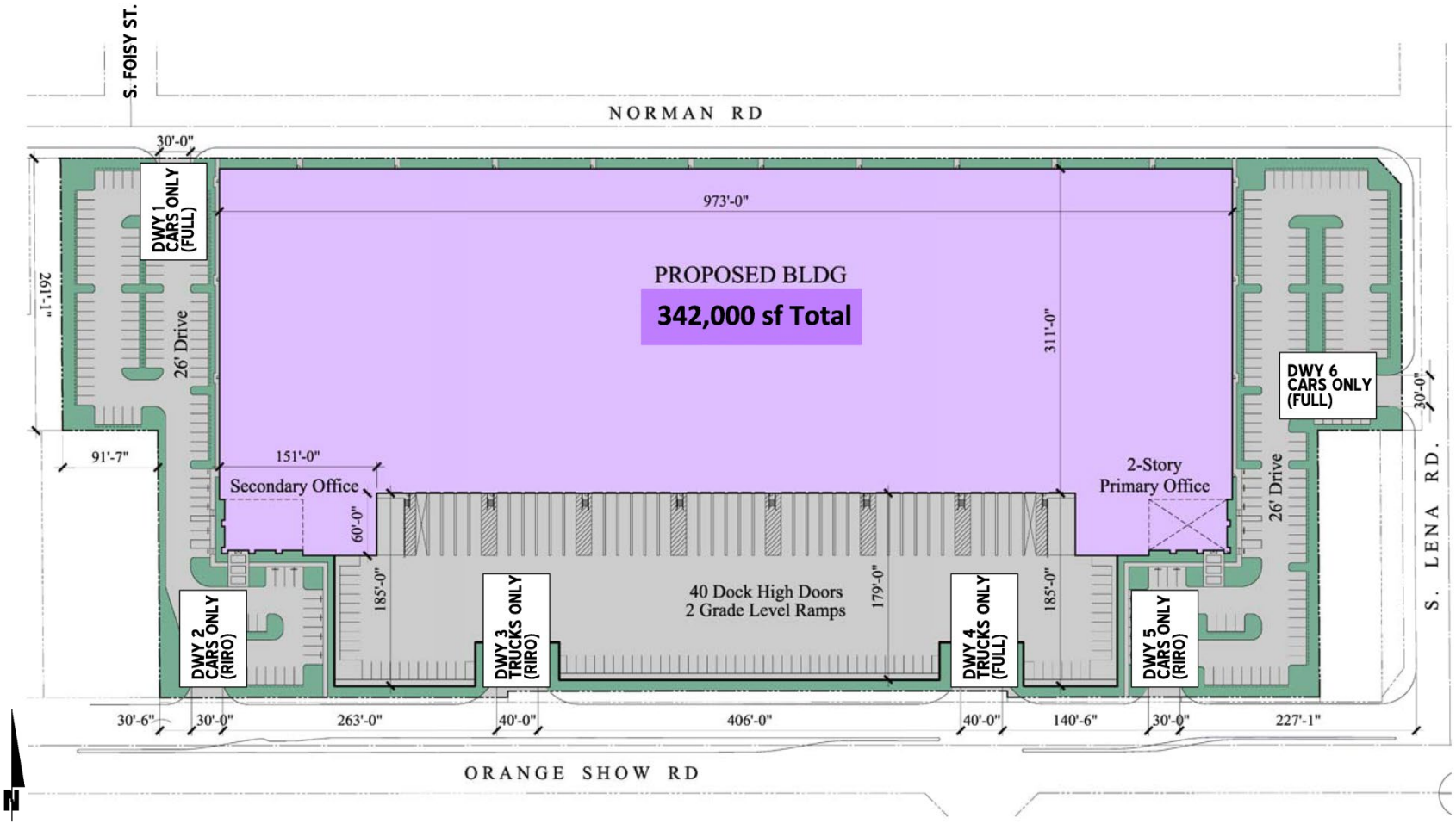
The Project business operations would primarily be conducted within the enclosed buildings, with the exception of traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to include: idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods. The Project is not anticipated to include refrigerated containers or reefers associated with cold storage. This noise analysis is intended to describe noise level impacts associated with the expected typical warehouse and distribution storage activities at the Project site.

According to the *Orange Show Logistics Center Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 575 trip-ends per day (actual vehicles) with 38 AM peak hour trips and 42 PM peak hour trips. (1) The net Project trip generation includes 219 truck trip-ends per day from the proposed buildings within the Project site. While the traffic volumes presented in the *Orange Show Logistics Center Traffic Impact Analysis* are expressed as Passenger Car Equivalent (PCE) trips, the Orange Show Logistics

Center Noise Impact Analysis relies on the net Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



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	
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		SLEEP DISTURBANCE
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 Community Noise Equivalent Level (CNEL), representing a composite twenty-four hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA Leq sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA Leq sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any particular time, but rather represents the total sound exposure. The City of San Bernardino relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

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

2.3.1 GEOMETRIC SPREADING

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

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been

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

2.3.3 Atmospheric Effects

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

2.3.4 Shielding

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

2.4 Traffic Noise Prediction

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

2.5 NOISE CONTROL

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

2.6 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receptor. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (4)

2.7 LAND USE COMPATIBILITY WITH NOISE

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

2.8 COMMUNITY RESPONSE TO NOISE

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

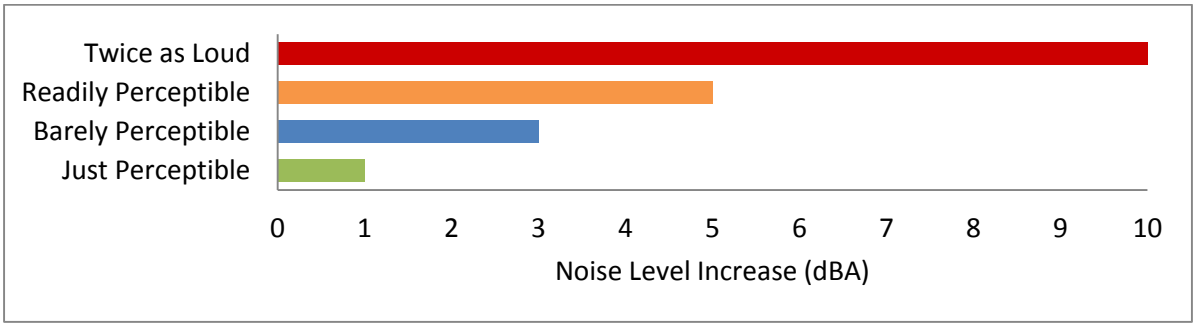
- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (6) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of

one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (6)

Despite this variability in behavior on an individual level, the population as a whole can be expected to exhibit the following responses to changes in noise levels 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



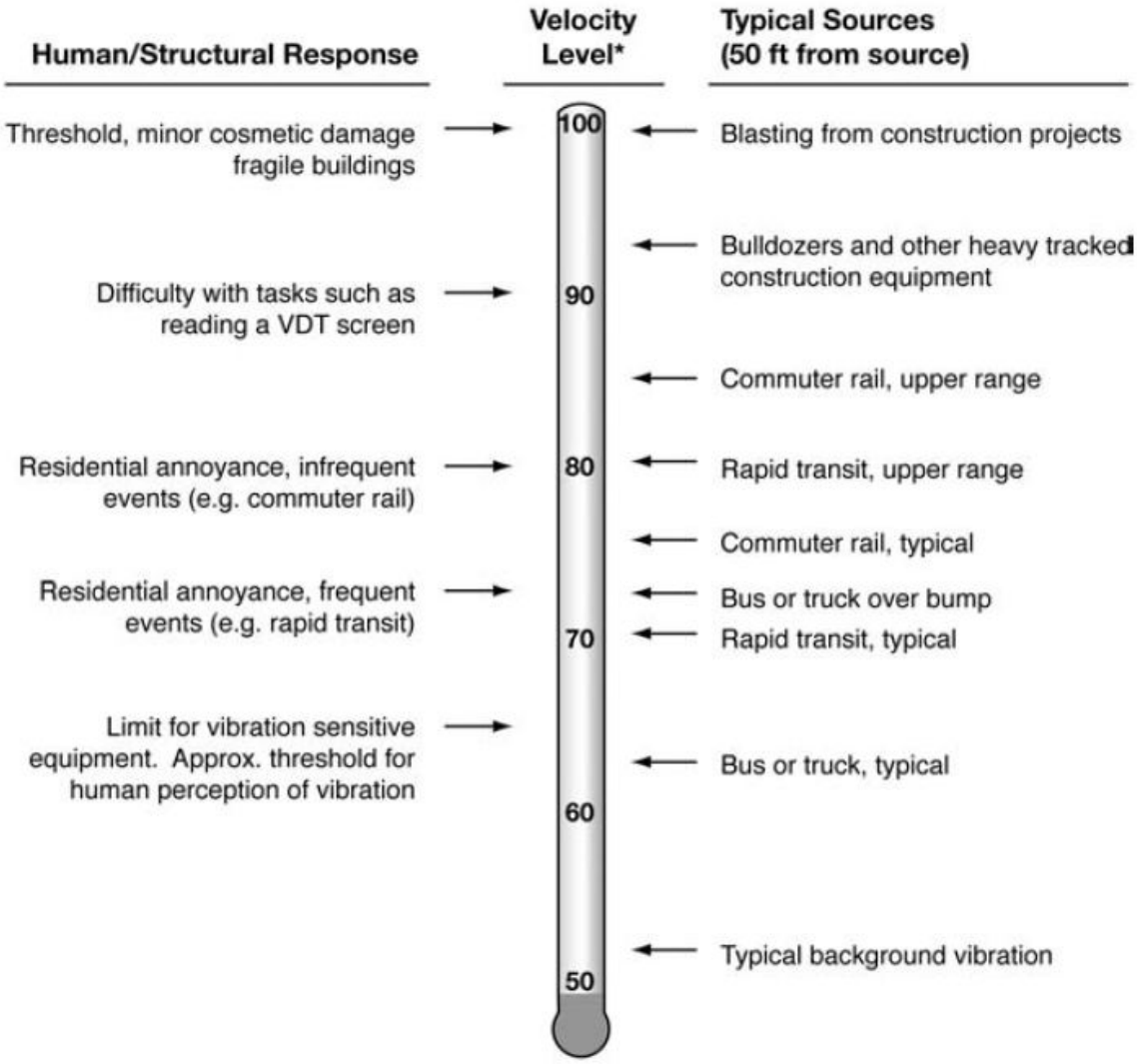
2.9 VIBRATION

According to the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (7), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

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 (OPR). (8) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*.

3.2 STATE OF CALIFORNIA GREEN BUILDING STANDARDS CODE

The 2014 State of California's Green Building Standards Code contains mandatory measures for non-residential building construction in Section 5.506 on Environmental Comfort. (9) 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 non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available and the noise level exceeds 65 dBA Leq for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required (Section 5.507.4.1).

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. (10) 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. (10)

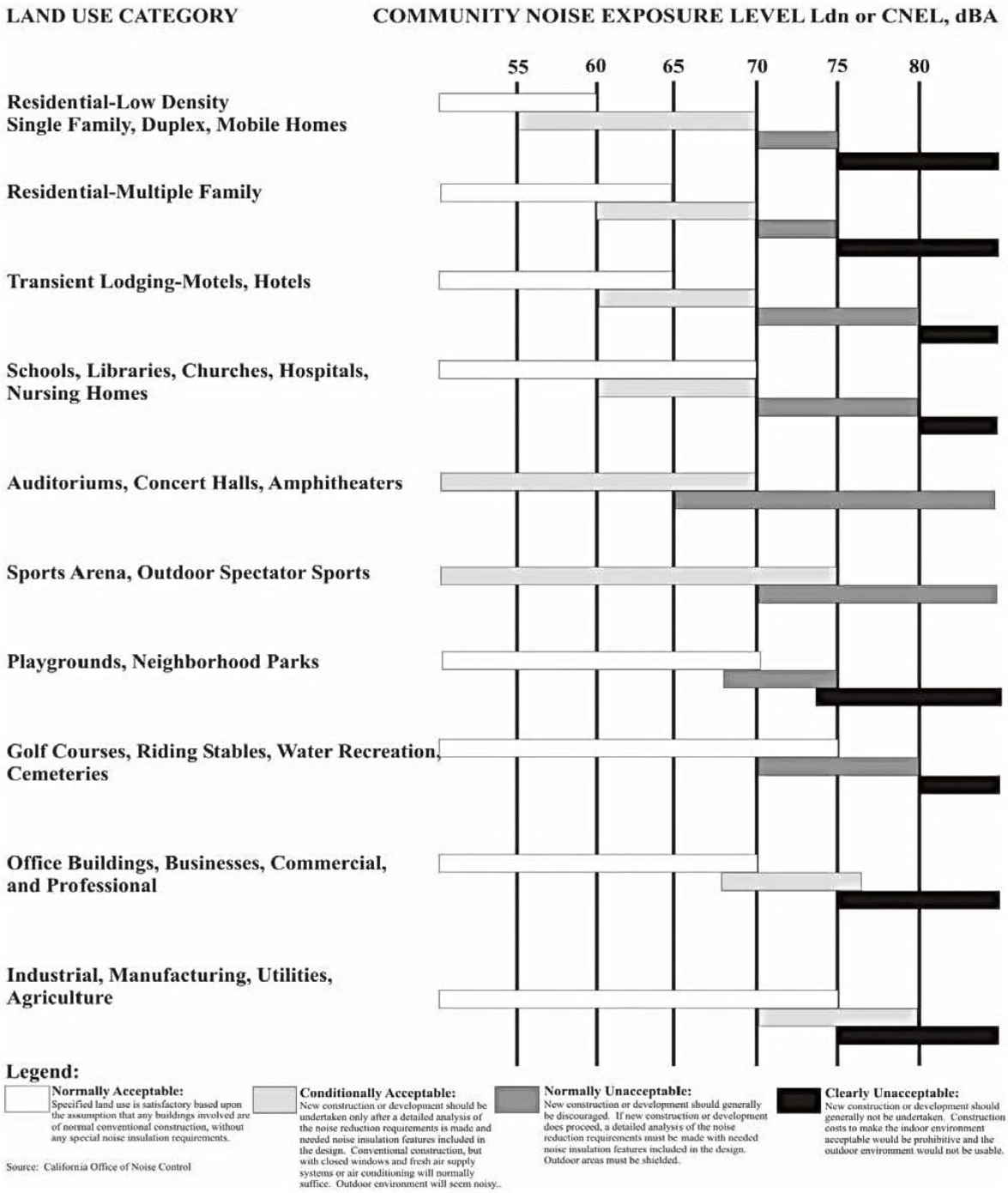
3.3.1 LAND USE COMPATIBILITY

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 industrial and manufacturing land uses, such as the Project, are considered *normally acceptable* with noise levels below 70 dBA CNEL and *conditionally acceptable* with noise levels of less than 75 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: 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 Orange Show Logistics Center 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 idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods originating from a designated fixed location or private property such as the Orange Show Logistics Center site, are evaluated against the policies adopted in the City's Development Code. (11)

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)). (12) 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 Orange Show Logistics Center Project to an exterior noise level of 65 dBA Leq for residential land use. (11) 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 Orange Show Logistics Center 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 shown 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. (12) 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 vibration standards found in Section 15.68.020 of the City of San Bernardino Municipal Code for equipment or machinery. The vibration standards indicate that no displacement of greater than 0.33 of one inch is allowed. To determine the vibration (inches per second) standard based on a displacement of 0.33 inches, the following equation from the *Caltrans Transportation and Construction- Induced Vibration Guidance Manual*:

$$V = 2 \pi f D$$

Where "V" is the velocity; "f" is the frequency (in Hertz); and "D" is the displacement of 0.33 inches. The typical frequency range of vibration from transportation and construction sources falls within 10 to 30 Hertz (Hz) and centers around 15 Hz. (13) Therefore, using the typical frequency range of 10 to 30 Hz, the vibration standards shown on Table 3-3 shall apply for the nearby residential receiver locations due to equipment or machinery associated with the operation and construction of the Project.

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 City of San Bernardino Municipal Code standards provide the basis

for determining the relative significance of potential Project related vibration impacts at the nearby sensitive receiver locations.

TABLE 3-3: CONSTRUCTION VIBRATION STANDARDS

Jurisdiction	Frequency (Hz)[1]	Displacement (inches)[2]	PPV (in/sec)[3]	RMS Velocity (in/sec)[4]
City of San Bernardino	10	0.033	2.1	1.5
	15	0.033	3.1	2.2
	20	0.033	4.1	2.9
	25	0.033	5.2	3.7
	30	0.033	6.2	4.4
Minimum Velocity Threshold:			2.1	1.5

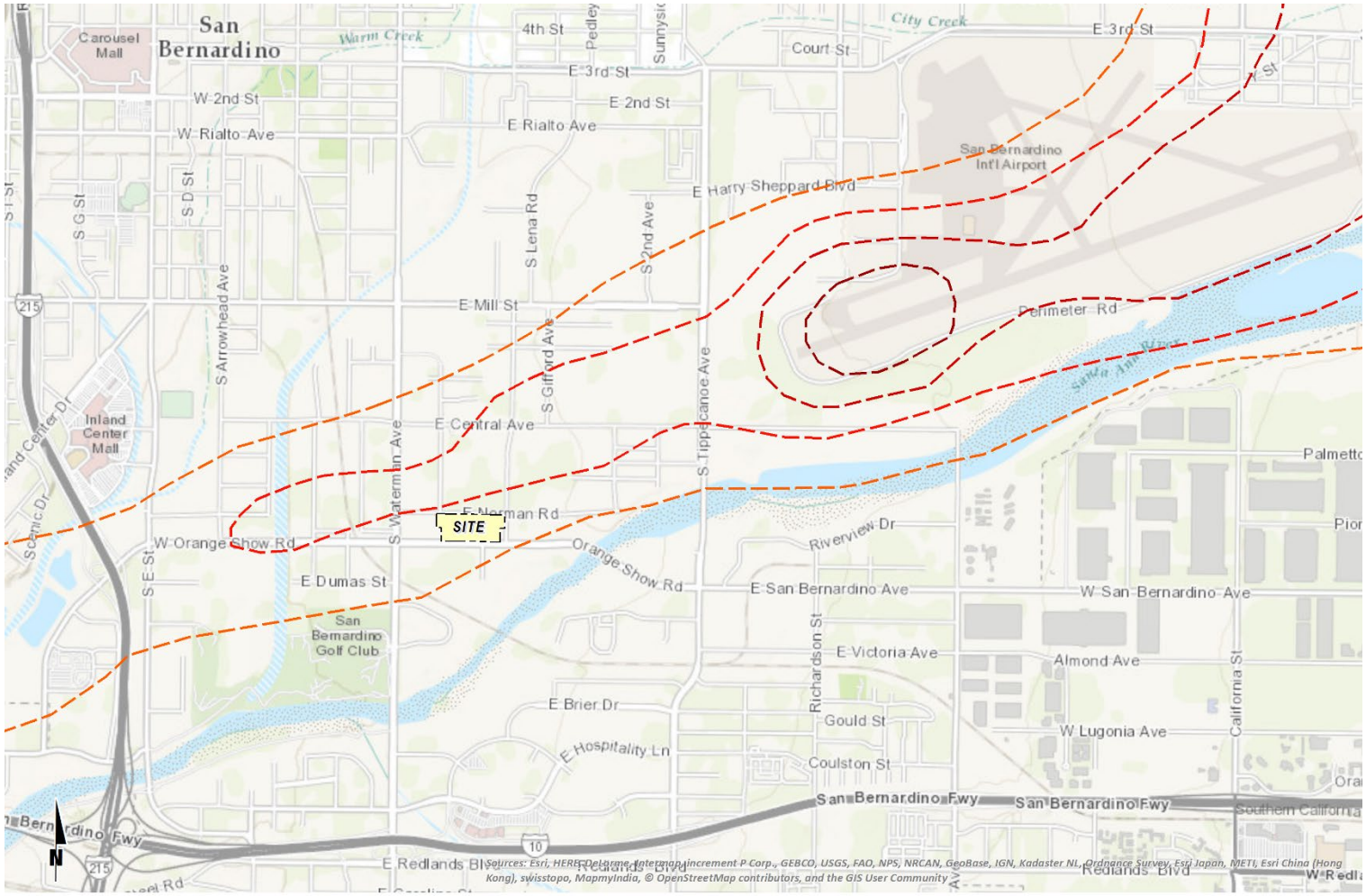
[1] The typical frequency range of vibration from transportation and construction sources based on the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.
[2] No displacement of greater than 0.033 of one inch is allowed based on Section 15.68.020 of the City of San Bernardino Municipal Code (Appendix 3.1) for equipment or machinery.
[3] Calculated Peak Particle Velocity (PPV) based on the basic vibration formula ($V=2\pi fD$) provided in the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013, where 'f' = frequency and 'D' = displacement.
[4] Calculated Root-Mean-Square (RMS) velocity based on the 0.71 conversion factor for the PPV as provided in Appendix A of the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.

3.7 SAN BERNARDINO INTERNATIONAL AIRPORT NOISE STANDARDS

The San Bernardino International Airport (SBIA) is located approximately 1.25 miles northeast of the Project site. The City of San Bernardino General Plan Noise Element policies and noise contours for the SBIA are used in this analysis to determine the potential aircraft-related noise impacts on the Project site.

As shown on Exhibit 3-C, the Project site is located within the 65 to 70 dBA CNEL noise level contour boundary of the SBIA. The City of San Bernardino General Plan Noise Element, Table N-3, indicates that the industrial (manufacturing) land use of the Project must satisfy an interior noise level standard of 65 dBA CNEL. (10) No exterior noise level standards are identified for industrial land uses in the City of San Bernardino General Plan Noise Element. The Project is anticipated to experience unmitigated exterior noise levels due to aircraft activity from the SBIA approaching 70 dBA CNEL, and therefore, must be able to achieve an interior noise level of 65 dBA CNEL. Standard building construction typically provides up to 25 dBA CNEL of attenuation, and therefore, the interior noise levels within the building at the Project site would satisfy the 65 dBA CNEL interior noise level standard of the City of San Bernardino General Plan Noise Element.

EXHIBIT 3-C: SAN BERNARDINO INTERNATIONAL AIRPORT NOISE LEVEL CONTOUR BOUNDARIES



LEGEND:

- Unmitigated 65 dBA CNEL Noise Level Contour Boundary
- Unmitigated 70 dBA CNEL Noise Level Contour Boundary
- Unmitigated 75 dBA CNEL Noise Level Contour Boundary
- Unmitigated 80 dBA CNEL Noise Level Contour Boundary

Source: County of San Bernardino, Norton Air Force Base, 1988.

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 apply to nearby public and private airports, if any, and the Project's land use compatibility, as discussed below.

The closest airport which would require additional noise analysis under CEQA guidelines E and F is the San Bernardino International Airport (SBIA). As previously shown on Exhibit 3-C, the Project site is located within the 65 to 70 dBA CNEL noise level contour boundary of the SBIA. Standard building construction typically provides up to 25 dBA CNEL of attenuation, and therefore, the interior noise levels within the building at the Project site would satisfy the 65 dBA CNEL interior noise level standard of the City of San Bernardino General Plan Noise Element. With standard building construction, the Project is expected to satisfy the City of San Bernardino 65 dBA CNEL interior noise level standard, and therefore, the potential impacts under CEQA guidelines E and F are considered to be *less than significant*, and are not further analyzed in this noise study.

4.1 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, 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.* (14)

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) (15) developed guidance to be used for the assessment of project-generated increases in noise levels that take into account the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (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 if the noise criteria may 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 the noise criteria for a given land use is exceeded. 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 the noise criteria for a given land use is exceeded, 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 AT NOISE-SENSITIVE RECEIVERS

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

Federal Interagency Committee on Noise (FICON), 1992.

4.2 NON-NOISE-SENSITIVE RECEIVERS

The City of San Bernardino General Plan Noise Element, Figure N-1, *Land Use Compatibility for Community Noise Exposure* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area, such as Industrial land uses. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise level for non-noise-sensitive land use, such as industrial use, is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* according to the *Land Use Compatibility for Community Noise Exposure*.

To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria are used. When the without Project noise levels at the non-noise-sensitive land uses are below the *normally acceptable* 70 dBA CNEL compatibility criteria, a *readily perceptible* 5 dBA or greater noise level increase is considered a significant impact. When the without Project noise levels are greater than the *normally acceptable* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the City of San Bernardino General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure normally acceptable* 70 dBA CNEL exterior noise level criteria.

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-2 shows the significance criteria summary matrix.

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
    - 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).

- When the noise levels at existing and future non-noise-sensitive land uses (e.g. industrial, etc.):
    - are less than the City of San Bernardino General Plan Noise Element, Figure N-1, *normally acceptable* 70 dBA and the Project creates a *readily perceptible* 5 dBA or greater Project-related noise level increase; or
    - are greater than the City of San Bernardino General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA and the Project creates a *barely perceptible* 3 dBA or greater Project-related noise level increase.

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 that produce exterior noise audible to sensitive receivers 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 vibration levels exceed the City of San Bernardino acceptable vibration standard of 1.5 in/sec (RMS) at sensitive receiver locations (City of San Bernardino Municipal Code, Section 15.68.020).

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	
	Non-Noise-Sensitive	if ambient is < 70 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Operational[2]	Noise-Sensitive	Exterior Residential Land Use	65 dBA Leq	
Construction[3]	Audible to sensitive receivers other than during hours permitted by the Noise Ordinance (between 7:00 a.m. to 8:00 p.m. on any day)			
	Sensitive	Vibration Level Threshold[4]	1.5 in/sec	n/a

[1] Source: FICON, 1992.
[2] Source: City of San Bernardino Development Code, Section 19.20.030.15(A) (Appendix 3.1).
[3] Source: City of San Bernardino Municipal Code, Section 8.54.070 (Appendix 3.2).
[4] Source: Section 15.68.020 of the City of San Bernardino Municipal Code (Appendix 3.1).
"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, eight 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 Wednesday, October 21st and Thursday, October 22nd, 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. (16)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing 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 noise impacts due to the Project's contribution to the ambient noise levels.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

N

LEGEND:

▲ 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 across Norman Road at a vacant lot designated as light industrial land use. The noise level measurements collected show an overall 24-hour exterior noise level of 63.8 dBA CNEL. The hourly noise levels measured at location L1 ranged from 55.2 to 62.0 dBA Leq during the daytime hours and from 51.9 to 61.2 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 58.7 dBA Leq with an average nighttime noise level of 56.9 dBA Leq.
- Location L2 represents the noise levels adjacent to the northern Project site boundary near existing residential homes on Norman Road. The noise level measurements collected show an overall 24-hour exterior noise level of 63.7 dBA CNEL. The hourly noise levels measured at location L2 ranged from 52.5 to 62.3 dBA Leq during the daytime hours and from 51.8 to 61.6 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 58.7 dBA Leq with an average nighttime noise level of 56.9 dBA Leq.
- Location L3 represents the noise levels west of the Project site on Orange Show Road at existing residential homes. The 24-hour CNEL indicates that the overall exterior noise level is 74.0 dBA CNEL. At location L3 the background ambient noise levels ranged from 65.7 to 73.0 dBA Leq during the daytime hours to levels of 63.0 to 71.0 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 69.4 dBA Leq with an average nighttime noise level of 66.9 dBA Leq.
- Located in a vacant lot at the southwest corner of Waterman Avenue and Orange Show Road, location L4 represents the noise levels near existing commercial land uses and office buildings. The noise level measurements collected show an overall 24-hour exterior noise level of 72.7 dBA CNEL. The hourly noise levels measured at location L4 ranged from 65.0 to 69.9 dBA Leq during the daytime hours and from 62.7 to 69.0 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 67.9 dBA Leq with an average nighttime noise level of 65.6 dBA Leq.
- Location L5 represents the noise levels at the southern Project site boundary on Orange Show Road north of the Alliance California Gateway South industrial land use. The 24-hour CNEL indicates that the overall exterior noise level is 72.6 dBA CNEL. At location L4 the background ambient noise levels ranged from 64.1 to 69.4 dBA Leq during the daytime hours to levels of 61.4 to 70.9 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 67.1 dBA Leq with an average nighttime noise level of 65.8 dBA Leq.
- Located on at the Project site boundary, location L6 represents the noise levels near the existing residential home at the northwest corner of Lena Road and Orange Show Road. The noise level measurements collected show an overall 24-hour exterior noise level of 74.5 dBA CNEL. The hourly noise levels measured at location L4 ranged from 66.0 to 72.9 dBA Leq during the daytime hours and from 63.2 to 70.8 dBA Leq during the nighttime hours. The energy (logarithmic) average

daytime noise level was calculated at 70.8 dBA Leq with an average nighttime noise level of 67.1 dBA Leq.

- Location L7 represents the noise levels southeast of the Project site between the Alliance Gateway South industrial land use and existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 75.9 dBA CNEL. The hourly noise levels measured at location L7 ranged from 67.4 to 76.6 dBA Leq during the daytime hours and from 63.0 to 73.2 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 72.3 dBA Leq with an average nighttime noise level of 68.6 dBA Leq.
- Located on south of the Project site on Park Center Drive, location L8 represents the noise levels near the existing InnovAge Senior Care and Inland Regional Center facilities. The noise level measurements collected show an overall 24-hour exterior noise level of 64.5 dBA CNEL. The hourly noise levels measured at location L8 ranged from 55.7 to 61.4 dBA Leq during the daytime hours and from 53.5 to 61.8 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 58.9 dBA Leq with an average nighttime noise level of 57.7 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 Orange Show Road near the noise level measurement locations. Additional background noise sources include aircraft flyover noise from the San Bernardino International Airport (SBIA), located approximately 1.25 miles northeast of the measurement locations. The 24-hour existing noise level measurements are shown on Table 5-1.

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	64'	Located north of the Project site across Norman Road at a vacant lot designated as light industrial land use.	58.7	56.9	63.8
L2	0'	Located adjacent to the northern Project site boundary near existing residential homes on Norman Road.	58.7	56.9	63.7
L3	1,430'	Located west of the Project site on Orange Show Road at existing residential homes.	69.4	66.9	74.0
L4	960'	Located in a vacant lot at the southwest corner of Waterman Avenue and Orange Show Road near existing office buildings.	67.9	65.6	72.7
L5	0'	Located at the southern Project site boundary on Orange Show Road north of the Alliance California Gateway South industrial land use.	67.1	65.8	72.6
L6	0'	Located at the Project site boundary near the existing residential home at the northwest corner of Lena Road and Orange Show Road.	70.8	67.1	74.5
L7	875'	Located southeast of the Project site between the Alliance Gateway South industrial land use and existing residential homes.	72.3	68.6	75.9
L8	1,310'	Located south of the Project site on Park Center Drive near the existing InnovAge Senior Care and Inland Regional Center facilities.	58.9	57.7	64.5

[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.

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

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 13 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. The ADT volumes used in this study are presented on Table 6-2 and obtained from the *Orange Show Logistics Center Traffic Impact Analysis* prepared by Urban Crossroads, Inc., for the following traffic scenarios: Existing, Existing plus Ambient Growth (EA) 2017, EA plus Cumulative (EAC) 2017, and Horizon Year 2040 ADT volumes. (1) Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Adjacent Planned Land Use[1]	Distance from Centerline to Nearest Adjacent Land Use (Feet)[2]	Posted Vehicle Speed (mph)
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	50'	50
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	50'	50
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	50'	40
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	50'	40
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	50'	40
6	Orange Show Rd.	e/o E St.	Commercial General	50'	40
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	50'	50
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	50'	50
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	50'	50
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	50'	50
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	50'	50
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	50'	50
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	50'	50

[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 General Plan Circulation Element.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]							
			Existing		Existing + Ambient (EA) Year 2017		EA + Cumulative (EAC) Year 2017		Horizon Year 2040	
			Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Waterman Av.	n/o Orange Show Rd.	12,957	12,992	13,746	13,781	14,442	14,477	29,386	29,421
2	Waterman Av.	s/o Orange Show Rd.	13,290	13,370	14,099	14,179	15,873	15,953	31,493	31,573
3	Lena Rd.	n/o Orange Show Rd.	2,418	2,445	2,566	2,593	2,566	2,593	3,034	3,061
4	Orange Show Rd.	w/o I-215 NB Ramps	14,052	14,104	14,908	14,960	17,180	17,232	24,857	24,909
5	Orange Show Rd.	e/o I-215 NB Ramps	22,346	22,441	23,707	23,802	27,773	27,868	38,655	38,750
6	Orange Show Rd.	e/o E St.	17,276	17,376	18,328	18,428	21,630	21,730	29,702	29,802
7	Orange Show Rd.	w/o Waterman Av.	14,055	14,157	14,911	15,013	16,629	16,731	21,592	21,694
8	Orange Show Rd.	e/o Waterman Av.	11,430	11,600	12,126	12,296	15,108	15,278	20,223	20,393
9	Orange Show Rd.	e/o Driveway 2	11,855	11,962	12,577	12,684	14,359	14,466	15,946	16,053
10	Orange Show Rd.	e/o Driveway 3	11,855	11,962	12,577	12,684	14,359	14,466	15,946	16,053
11	Orange Show Rd.	e/o Driveway 4	11,855	11,902	12,577	12,624	13,959	14,006	15,741	15,788
12	Orange Show Rd.	e/o Driveway 5	11,855	11,902	12,577	12,624	12,327	12,374	15,332	15,379
13	Orange Show Rd.	e/o Lena Rd.	10,879	10,929	11,542	11,592	11,292	11,342	14,100	14,150

[1] Source: Orange Show Logistics Center Traffic Impact Analysis, Urban Crossroads, Inc., December 2015.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	77.09%	5.94%	16.97%	100.00%
Medium Trucks	84.84%	1.61%	13.55%	100.00%
Heavy Trucks	68.68%	11.41%	19.91%	100.00%

[1] Source: Based on existing 24-hour classification counts by vehicle type taken on 11/17/2015 on Orange Show Road between Waterman Avenue and Lena Road (Orange Show Logistics Center Traffic Impact Analysis, Urban Crossroads, Inc., December 2015). "Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

According to the *Orange Show Logistics Center Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 575 trip-ends per day (actual vehicles) with 38 AM peak hour trips and 42 PM peak hour trips. (1) The net Project trip generation includes 219 truck trip-ends per day from the proposed building within the Project site. While the traffic volumes presented in the *Orange Show Logistics Center Traffic Impact Analysis* are expressed as Passenger Car Equivalent (PCE) trips, the Orange Show Logistics Center Noise Impact Analysis relies on the net Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

To quantify the off-site noise levels, the Project related truck trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project related truck trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix.

The 219 daily Project truck trip-ends were assigned to the 13 individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the *Traffic Impact Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-5 to 6-8 show the vehicle mixes used for the with Project traffic scenarios.

TABLE 6-4: WITHOUT PROJECT CONDITIONS VEHICLE MIX

Classification	Total % Traffic Flow[1]			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	88.56%	4.69%	6.76%	100.00%

[1] Based on existing 24-hour classification counts by vehicle type taken on 11/17/2015 on Orange Show Road between Waterman Avenue and Lena Road (Orange Show Logistics Center Traffic Impact Analysis, Urban Crossroads, Inc., December 2015). Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-5: EXISTING WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Waterman Av.	n/o Orange Show Rd.	88.64%	4.65%	6.71%	100.00%
2	Waterman Av.	s/o Orange Show Rd.	88.48%	4.65%	6.87%	100.00%
3	Lena Rd.	n/o Orange Show Rd.	89.01%	4.50%	6.49%	100.00%
4	Orange Show Rd.	w/o I-215 NB Ramps	88.53%	4.66%	6.81%	100.00%
5	Orange Show Rd.	e/o I-215 NB Ramps	88.56%	4.64%	6.80%	100.00%
6	Orange Show Rd.	e/o E St.	88.63%	4.60%	6.77%	100.00%
7	Orange Show Rd.	w/o Waterman Av.	88.64%	4.59%	6.77%	100.00%
8	Orange Show Rd.	e/o Waterman Av.	88.49%	4.56%	6.95%	100.00%
9	Orange Show Rd.	e/o Driveway 2	88.63%	4.53%	6.83%	100.00%
10	Orange Show Rd.	e/o Driveway 3	88.54%	4.57%	6.89%	100.00%
11	Orange Show Rd.	e/o Driveway 4	88.60%	4.63%	6.77%	100.00%
12	Orange Show Rd.	e/o Driveway 5	88.60%	4.63%	6.77%	100.00%
13	Orange Show Rd.	e/o Lena Rd.	88.50%	4.67%	6.83%	100.00%

[1] Source: Orange Show Logistics Center Traffic Impact Analysis, Urban Crossroads, Inc., December 2015.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-6: EA 2017 WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Waterman Av.	n/o Orange Show Rd.	88.64%	4.65%	6.71%	100.00%
2	Waterman Av.	s/o Orange Show Rd.	88.49%	4.65%	6.86%	100.00%
3	Lena Rd.	n/o Orange Show Rd.	89.00%	4.51%	6.50%	100.00%
4	Orange Show Rd.	w/o I-215 NB Ramps	88.53%	4.66%	6.81%	100.00%
5	Orange Show Rd.	e/o I-215 NB Ramps	88.56%	4.64%	6.79%	100.00%
6	Orange Show Rd.	e/o E St.	88.62%	4.61%	6.77%	100.00%
7	Orange Show Rd.	w/o Waterman Av.	88.64%	4.59%	6.77%	100.00%
8	Orange Show Rd.	e/o Waterman Av.	88.49%	4.57%	6.94%	100.00%
9	Orange Show Rd.	e/o Driveway 2	88.63%	4.54%	6.83%	100.00%
10	Orange Show Rd.	e/o Driveway 3	88.54%	4.58%	6.88%	100.00%
11	Orange Show Rd.	e/o Driveway 4	88.60%	4.64%	6.77%	100.00%
12	Orange Show Rd.	e/o Driveway 5	88.60%	4.64%	6.77%	100.00%
13	Orange Show Rd.	e/o Lena Rd.	88.50%	4.67%	6.83%	100.00%

[1] Source: Orange Show Logistics Center Traffic Impact Analysis, Urban Crossroads, Inc., December 2015.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-7: EAC 2017 WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Waterman Av.	n/o Orange Show Rd.	88.63%	4.65%	6.71%	100.00%
2	Waterman Av.	s/o Orange Show Rd.	88.50%	4.65%	6.85%	100.00%
3	Lena Rd.	n/o Orange Show Rd.	89.00%	4.51%	6.50%	100.00%
4	Orange Show Rd.	w/o I-215 NB Ramps	88.54%	4.66%	6.80%	100.00%
5	Orange Show Rd.	e/o I-215 NB Ramps	88.56%	4.65%	6.79%	100.00%
6	Orange Show Rd.	e/o E St.	88.61%	4.62%	6.77%	100.00%
7	Orange Show Rd.	w/o Waterman Av.	88.63%	4.60%	6.77%	100.00%
8	Orange Show Rd.	e/o Waterman Av.	88.50%	4.59%	6.91%	100.00%
9	Orange Show Rd.	e/o Driveway 2	88.62%	4.56%	6.82%	100.00%
10	Orange Show Rd.	e/o Driveway 3	88.54%	4.59%	6.86%	100.00%
11	Orange Show Rd.	e/o Driveway 4	88.59%	4.64%	6.77%	100.00%
12	Orange Show Rd.	e/o Driveway 5	88.59%	4.64%	6.77%	100.00%
13	Orange Show Rd.	e/o Lena Rd.	88.51%	4.67%	6.82%	100.00%

[1] Source: Orange Show Logistics Center Traffic Impact Analysis, Urban Crossroads, Inc., December 2015.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-8: HORIZON YEAR 2040 WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Waterman Av.	n/o Orange Show Rd.	88.60%	4.67%	6.73%	100.00%
2	Waterman Av.	s/o Orange Show Rd.	88.53%	4.67%	6.81%	100.00%
3	Lena Rd.	n/o Orange Show Rd.	88.91%	4.54%	6.55%	100.00%
4	Orange Show Rd.	w/o I-215 NB Ramps	88.54%	4.67%	6.79%	100.00%
5	Orange Show Rd.	e/o I-215 NB Ramps	88.56%	4.66%	6.78%	100.00%
6	Orange Show Rd.	e/o E St.	88.60%	4.64%	6.76%	100.00%
7	Orange Show Rd.	w/o Waterman Av.	88.61%	4.62%	6.77%	100.00%
8	Orange Show Rd.	e/o Waterman Av.	88.52%	4.61%	6.87%	100.00%
9	Orange Show Rd.	e/o Driveway 2	88.61%	4.57%	6.81%	100.00%
10	Orange Show Rd.	e/o Driveway 3	88.54%	4.60%	6.85%	100.00%
11	Orange Show Rd.	e/o Driveway 4	88.59%	4.65%	6.76%	100.00%
12	Orange Show Rd.	e/o Driveway 5	88.59%	4.65%	6.76%	100.00%
13	Orange Show Rd.	e/o Lena Rd.	88.51%	4.68%	6.81%	100.00%

[1] Source: Orange Show Logistics Center Traffic Impact Analysis, Urban Crossroads, Inc., December 2015.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

6.3 VIBRATION ASSESSMENT

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

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-9. 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: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 6-9: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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

Source: Federal Transit Administration, 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 *Orange Show Logistics Center Traffic Impact Analysis*. (1) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- Existing Without / With Project: This scenario refers to the existing present-day noise conditions, without and with the proposed Project.
- Existing plus Ambient Growth (EA) 2017 Without / With Project: This scenario refers to the background noise conditions at future Year 2017 without and with the proposed Project plus ambient growth.
- EA plus Cumulative (EAC) 2017 Without / With Project: This scenario refers to the background noise conditions at future Year 2017 without and with the proposed Project. This scenario corresponds to 2017 conditions, and includes all cumulative projects identified in the Traffic Impact Analysis.
- Horizon Year 2040 Without / With Project: This scenario refers to the background noise conditions at future Horizon Year 2040 without and with the proposed Project. This scenario corresponds to 2040 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 13 roadway segments surrounding the Project were calculated based on the changes in the average daily traffic volumes. Based on the noise impact significance criteria described in Section 4 and shown on Table 4-2, a significant off-site traffic noise level impact occurs:

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
  - 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).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g. industrial, etc.):
  - are less than the City of San Bernardino General Plan Noise Element, Figure N-1, *normally acceptable* 70 dBA and the Project creates a *readily perceptible* 5 dBA or greater Project-related noise level increase; or
  - are greater than the City of San Bernardino General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA and the Project creates a *barely perceptible* 3 dBA or greater Project-related noise level increase.

The land uses adjacent to the study area roadways conveying Project traffic consist mostly of non-noise-sensitive industrial designated land uses, as shown on Table 7-1, however some non-conforming residential land uses exist on roadway segments such as Orange Show Road west of Waterman Avenue and east of Lena Road, among others. Therefore, both the noise-sensitive and non-noise-sensitive significance criteria are applied to the study area roadway segments. Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not take into account the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 through 7-8 present a summary of the exterior traffic noise levels, without barrier attenuation, for the 13 study area roadway segments analyzed from the without Project to the with Project conditions in each of the four timeframes: Existing, Existing plus Ambient Growth (EA) 2017, EA plus Cumulative (EAC) 2017, and Horizon Year 2040 conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the eight traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	75.0	108	232	500
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	75.1	110	236	509
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	65.9	RW	58	124
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	73.6	87	186	402
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	75.6	118	254	547
6	Orange Show Rd.	e/o E St.	Commercial General	74.5	99	214	461
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	75.4	114	245	528
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	74.5	99	214	460
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	74.6	102	219	472
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	74.6	102	219	472
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	74.6	102	219	472
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	74.6	102	219	472
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	74.2	96	207	445

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	75.0	108	232	501
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	75.2	112	241	519
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	65.9	RW	58	124
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	73.7	88	189	407
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	75.7	119	257	554
6	Orange Show Rd.	e/o E St.	Commercial General	74.6	101	218	469
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	75.5	116	250	539
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	74.8	104	224	482
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	74.9	105	227	489
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	74.9	105	227	489
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	74.7	103	221	476
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	74.7	103	221	476
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	74.3	97	209	450

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: EA 2017 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	75.3	112	242	521
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	75.4	114	246	529
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	66.2	RW	60	129
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	73.8	90	194	418
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	75.8	123	264	569
6	Orange Show Rd.	e/o E St.	Commercial General	74.7	103	223	480
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	75.6	118	255	550
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	74.7	103	222	479
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	74.9	106	228	491
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	74.9	106	228	491
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	74.9	106	228	491
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	74.9	106	228	491
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	74.5	100	215	463

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: EAP 2017 CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	75.3	112	242	521
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	75.5	116	251	540
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	66.2	RW	60	129
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	73.9	91	196	423
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	75.9	124	268	576
6	Orange Show Rd.	e/o E St.	Commercial General	74.8	105	226	487
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	75.7	121	260	560
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	75.0	108	232	500
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	75.1	109	236	507
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	75.1	109	236	507
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	74.9	107	230	495
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	74.9	107	230	495
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	74.6	101	217	468

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-5: EAC 2017 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	75.5	116	250	538
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	75.9	123	266	573
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	66.2	RW	60	129
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	74.4	99	213	459
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	76.5	136	294	633
6	Orange Show Rd.	e/o E St.	Commercial General	75.4	115	249	535
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	76.1	127	274	591
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	75.7	119	257	554
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	75.5	115	249	536
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	75.5	115	249	536
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	75.3	113	244	526
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	74.8	104	225	484
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	74.4	98	212	457

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-6: EAPC 2017 CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	75.5	116	250	538
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	76.0	126	271	583
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	66.2	RW	60	129
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	74.5	100	215	464
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	76.6	138	297	639
6	Orange Show Rd.	e/o E St.	Commercial General	75.5	117	252	543
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	76.2	129	279	601
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	75.9	124	267	574
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	75.6	119	256	552
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	75.6	119	256	552
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	75.4	114	246	530
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	74.8	105	227	489
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	74.5	99	214	461

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-7: HORIZON YEAR 2040 WITHOUT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	78.6	186	401	864
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	78.9	195	420	905
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	66.9	RW	67	145
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	76.1	127	273	588
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	78.0	170	366	789
6	Orange Show Rd.	e/o E St.	Commercial General	76.8	143	307	662
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	77.2	152	327	703
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	76.9	145	313	673
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	75.9	124	267	575
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	75.9	124	267	575
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	75.9	123	264	570
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	75.7	121	260	560
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	75.4	114	246	529

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-8: HORIZON YEAR 2040 WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	78.6	186	401	864
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	78.9	197	424	913
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	66.9	RW	67	145
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	76.1	127	275	592
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	78.0	171	369	795
6	Orange Show Rd.	e/o E St.	Commercial General	76.9	144	310	668
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	77.3	154	331	712
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	77.1	149	321	692
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	76.1	127	274	590
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	76.1	127	274	590
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	75.9	124	266	574
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	75.8	122	262	564
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	75.4	115	248	534

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING CONDITION PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-1 presents the Existing without Project conditions CNEL noise levels. From this we can see that the exterior noise levels are expected to range from 65.9 to 75.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 65.9 to 75.7 dBA CNEL. As shown on Table 7-9 the Project will generate a noise level increase of up to 0.3 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *less than significant* under Existing conditions at the land uses adjacent to roadways conveying Project traffic.

TABLE 7-9: EXISTING CONDITION OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Threshold Exceeded?[3]	
				No Project	With Project	Project Addition	Noise-Sensitive	Non Noise-Sensitive
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	75.0	75.0	0.0	No	No
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	75.1	75.2	0.1	No	No
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	65.9	65.9	0.0	No	No
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	73.6	73.7	0.1	No	No
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	75.6	75.7	0.1	No	No
6	Orange Show Rd.	e/o E St.	Commercial General	74.5	74.6	0.1	No	No
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	75.4	75.5	0.1	No	No
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	74.5	74.8	0.3	No	No
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	74.6	74.9	0.3	No	No
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	74.6	74.9	0.3	No	No
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	74.6	74.7	0.1	No	No
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	74.6	74.7	0.1	No	No
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	74.2	74.3	0.1	No	No

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[3] Significance Criteria (Section 4).

7.3 EA 2017 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-10 presents a comparison of the EA 2017 without and with Project conditions CNEL noise levels. Table 7-3 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 66.2 to 75.8 dBA CNEL without the Project. Table 7-4 presents the EA 2017 with Project conditions noise level contours that are expected to range from 66.3 to 75.9 dBA CNEL. As shown on Table 7-10 the Project will generate *less than significant* noise level increases of up to 0.3 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related increases represent a *less than significant* impact under EA 2017 conditions.

TABLE 7-10: EA 2017 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Threshold Exceeded?[3]	
				No Project	With Project	Project Addition	Noise-Sensitive	Non Noise-Sensitive
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	75.3	75.3	0.0	No	No
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	75.4	75.5	0.1	No	No
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	66.2	66.2	0.0	No	No
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	73.8	73.9	0.1	No	No
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	75.8	75.9	0.1	No	No
6	Orange Show Rd.	e/o E St.	Commercial General	74.7	74.8	0.1	No	No
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	75.6	75.7	0.1	No	No
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	74.7	75.0	0.3	No	No
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	74.9	75.1	0.2	No	No
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	74.9	75.1	0.2	No	No
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	74.9	74.9	0.0	No	No
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	74.9	74.9	0.0	No	No
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	74.5	74.6	0.1	No	No

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[3] Significance Criteria (Section 4).

7.4 EAC 2017 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-11 presents a comparison of the EAC 2017 without and with Project conditions CNEL noise levels. Table 7-5 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 66.2 to 76.5 dBA CNEL without the Project. Table 7-6 presents the EAC 2017 with Project conditions noise level contours that are expected to range from 66.2 to 76.6 dBA CNEL. As shown on Table 7-11 the Project will generate *less than significant* noise level increases of up to 0.2 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related increases represent a *less than significant* impact under EAC 2017 conditions.

TABLE 7-11: EAC 2017 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Threshold Exceeded?[3]	
				No Project	With Project	Project Addition	Noise-Sensitive	Non Noise-Sensitive
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	75.5	75.5	0.0	No	No
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	75.9	76.0	0.1	No	No
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	66.2	66.2	0.0	No	No
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	74.4	74.5	0.1	No	No
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	76.5	76.6	0.1	No	No
6	Orange Show Rd.	e/o E St.	Commercial General	75.4	75.5	0.1	No	No
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	76.1	76.2	0.1	No	No
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	75.7	75.9	0.2	No	No
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	75.5	75.6	0.1	No	No
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	75.5	75.6	0.1	No	No
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	75.3	75.4	0.1	No	No
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	74.8	74.8	0.0	No	No
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	74.4	74.5	0.1	No	No

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[3] Significance Criteria (Section 4).

7.5 HORIZON YEAR 2040 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-12 presents a comparison of the Horizon Year 2040 without and with Project conditions CNEL noise levels. Table 7-7 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 66.9 to 78.9 dBA CNEL without the Project. Table 7-8 presents the Horizon Year 2040 with Project conditions noise level contours that are expected to range from 66.9 to 78.9 dBA CNEL. As shown on Table 7-12 the Project will generate *less than significant* noise level increases of up to 0.2 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related increases represent a *less than significant* impact under Horizon Year 2040 conditions.

TABLE 7-12: HORIZON YEAR 2040 OFF-SITE PROJECT RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Planned Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Threshold Exceeded?[3]	
				No Project	With Project	Project Addition	Noise-Sensitive	Non Noise-Sensitive
1	Waterman Av.	n/o Orange Show Rd.	Office Industrial Park	78.6	78.6	0.0	No	No
2	Waterman Av.	s/o Orange Show Rd.	Office Industrial Park	78.9	78.9	0.0	No	No
3	Lena Rd.	n/o Orange Show Rd.	Industrial Light	66.9	66.9	0.0	No	No
4	Orange Show Rd.	w/o I-215 NB Ramps	Commercial General	76.1	76.1	0.0	No	No
5	Orange Show Rd.	e/o I-215 NB Ramps	Commercial General	78.0	78.0	0.0	No	No
6	Orange Show Rd.	e/o E St.	Commercial General	76.8	76.9	0.1	No	No
7	Orange Show Rd.	w/o Waterman Av.	Industrial Light	77.2	77.3	0.1	No	No
8	Orange Show Rd.	e/o Waterman Av.	Industrial Light	76.9	77.1	0.2	No	No
9	Orange Show Rd.	e/o Driveway 2	Industrial Light	75.9	76.1	0.2	No	No
10	Orange Show Rd.	e/o Driveway 3	Industrial Light	75.9	76.1	0.2	No	No
11	Orange Show Rd.	e/o Driveway 4	Industrial Light	75.9	75.9	0.0	No	No
12	Orange Show Rd.	e/o Driveway 5	Industrial Light	75.7	75.8	0.1	No	No
13	Orange Show Rd.	e/o Lena Rd.	Industrial Light	75.4	75.4	0.0	No	No

[1] Source: City of San Bernardino General Plan Land Use Element, Figure LU-2.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[3] Significance Criteria (Section 4).

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8 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following twelve receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. Many of these receiver locations coincide with the existing noise level measurement locations outlined in Section 5.3 and shown on Exhibit 5-A. 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.

Representative sensitive receivers in the vicinity of the Project site include the single-family residential homes represented by locations R2 to R7, and R9 to R12. Receiver location R1 represents the Allen Chapel and receiver location R8 represents the InnovAge Senior Care facility in the Project study area. The closest sensitive receiver is represented by location R5 where an existing non-conforming residential home is located approximately 17 feet east of the Project site boundary. “Non-confirming” means that the use (the home) exists, but the use does not conform to the City’s General Plan land use designation and/or zoning designation for the property. In this case, all of the residential homes located immediately around the Project site are located on properties that are designated and zoned for industrial use.

R1 Located approximately 91 feet north of the Project site across Norman Road, R1 represents the existing Allen Chapel.

R2 Location R2 represents existing residential homes located roughly 95 feet north of the Project site across Norman Road.

R3 Location R3 represents the existing residential home situated north of the Project site at a distance of approximately 82 feet across Norman Road. A long-term noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R4 Location R4 represents the existing residential homes situated approximately 177 feet northeast of the Project site. A long-term noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R5 At a distance of approximately 17 feet, location R5 represents a single-family residential home situated on Orange Show Road, east of the Project site. A long-term noise measurement was taken near this location, L6, to describe the existing ambient noise environment.

R6 Location R6 represents the existing residential home situated east of the Project site at a distance of approximately 245 feet across S. Lena Road.

R7 Located approximately 1,005 feet southeast of the Project site across Orange Show Road, R7 represents existing single-family residential homes. A long-term noise measurement was taken near this location, L7, to describe the existing ambient noise environment.

R8 Location R8 represents the existing InnovAge Senior Care facility located roughly 1,083 feet south of the Project site on Park Center Circle. A long-term noise measurement was taken near this location, L8, to describe the existing ambient noise environment.

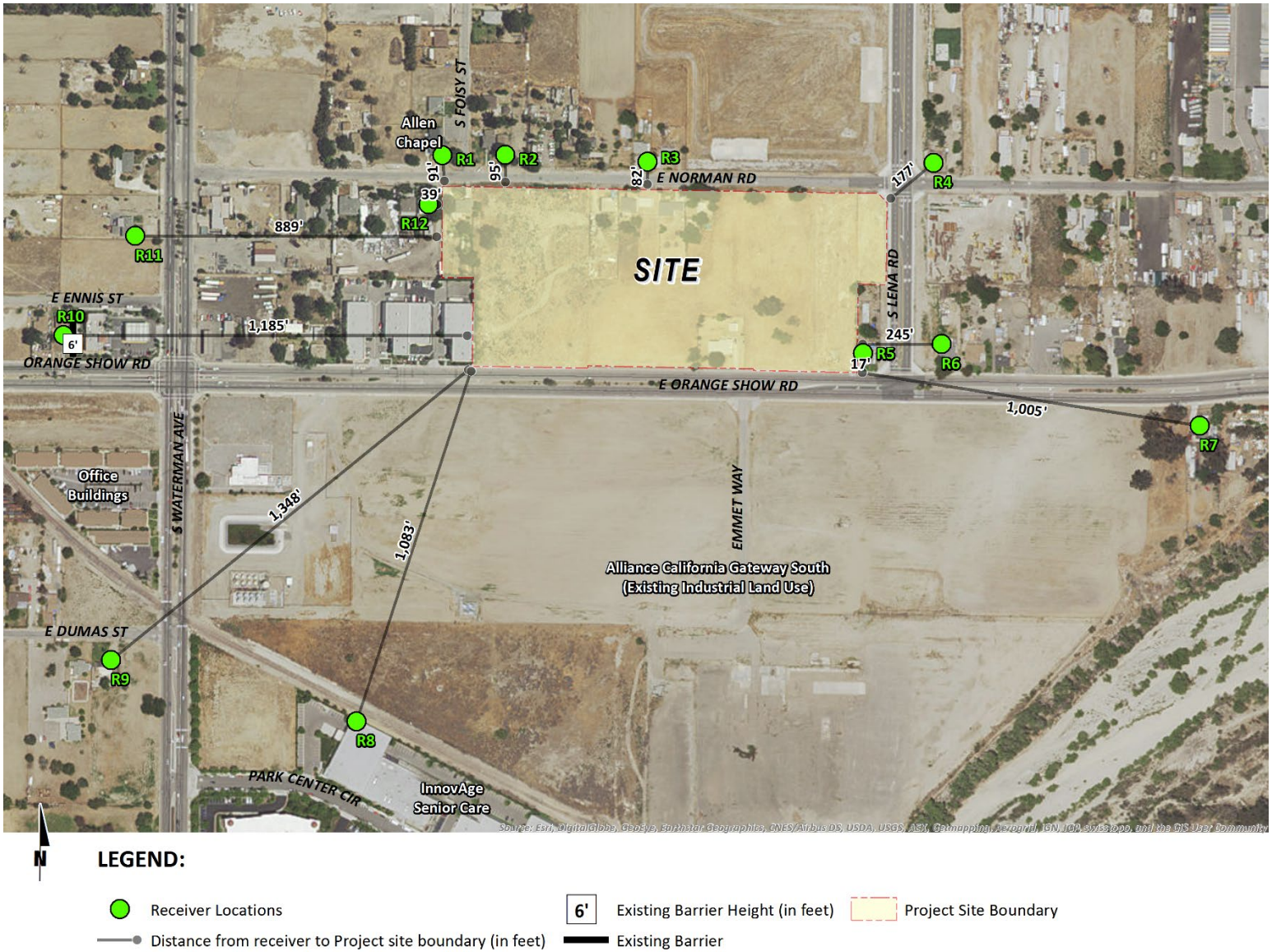
R9 Location R9 represents the existing residential home situated southwest of the Project site at a distance of approximately 1,348 feet on Dumas Street.

R10 Location R10 represents the existing residential homes situated approximately 1,186 feet west of the Project site. A long-term noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R11 At a distance of approximately 889 feet, location R11 represents a single-family residential home situated on Waterman Avenue, west of the Project site.

R12 Location R12 represents the existing residential home situated east of the Project site at a distance of approximately 39 feet on Norman Road.

EXHIBIT 8-A: RECEIVER LOCATIONS



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9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at nearby receiver locations resulting from operation of the proposed Orange Show Logistics Center. Exhibit 9-A identifies the representative receiver locations and noise source locations used to assess the operational noise levels.

9.1 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)). (12) 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 Orange Show Logistics Center Project to an exterior noise level of 65 dBA Leq for residential land use. (11)

9.2 OPERATIONAL NOISE SOURCES

At the time this noise analysis was prepared the future tenants of the proposed Project were unknown. This analysis assumes the Project would be operational 24 hours per day, seven days per week. Business operations would primarily be conducted within the enclosed buildings, with the exception of traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. The on-site Project related noise sources are expected to include: idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods. This noise analysis is intended to describe noise level impacts associated with the expected typical warehouse and distribution storage activities at the Project site.

9.3 REFERENCE NOISE LEVELS

Since the future tenants of the proposed Project are unknown, the Project's operational noise levels were estimated based on reference noise level measurements of similar operational activities. From a noise standpoint, a warehouse facility's operational characteristics are the primary factors that affect operational noise levels; the geographic location of the facility does not substantially influence operational noise levels. The noise level measurements collected from the two operating facilities described below are representative of stationary noise levels expected at the Project site because these facilities have 24-hour operational activities that are comparable to the activities expected at the Project site. The reference noise levels are intended to describe the expected operational noise sources that may include idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods. To estimate the Project off-site operational noise impacts associated with the Orange Show Logistics Center, the following reference noise level measurements were collected, as shown on Table 9-1. Appendix 9.1 includes reference noise source photos for each distribution/warehouse reference noise sources.

9.3.1 MOTIVATIONAL FULFILLMENT & LOGISTICS SERVICES DISTRIBUTION FACILITY (DRY GOODS)

Short-term reference noise level measurements were collected on Wednesday, January 7th, 2015, by Urban Crossroads, Inc. at the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino. The noise level measurements represent the typical weekday dry goods logistics warehouse operation in a single building with a loading dock area on the western side of the building façade. Two reference noise level measurements were taken at this location, including entry gate activity and unloading/docking activity noise sources. Up to ten trucks were observed in the loading dock area including a combination of track trailer semi-trucks, two-axle delivery trucks, and background forklift operations.

ENTRY GATE ACTIVITY

The entry gate activity noise level measurement was taken at the southern entry gate over a fifteen minute period and represents multiple noise sources producing a reference noise level of 64.0 dBA Leq. The noise sources included at this measurement location account for the rattling and squeaking during normal opening and closing operations, the gate closure equipment, truck engines idling outside the entry gate, and background forklift backup alarm noise.

UNLOADING/DOCKING ACTIVITY

The unloading/docking activity noise level measurement was taken over a fifteen minute period and represents multiple noise sources taken from the center of loading dock activities generating a reference noise level of 67.2 dBA Leq. At this measurement location, the noise sources associated with employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition, during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine and air brakes noise.

9.3.2 VEGFRESH FARMS / FEDEX DISTRIBUTION FACILITY

Urban Crossroads, Inc. collected a 24-hour reference noise level measurement on Tuesday, January 22, 2013 at the Veg Fresh Farms and FedEx distribution facility located at 500 East Orangethorpe Avenue in the City of Anaheim. This is the same facility used to describe the operational noise level measurements for the Alliance California Gateway South Building 3 project immediately across Orange Show Road from the Project site (19), The Veg Fresh Farms that includes cold storage and FedEx distribution center noise level measurement represent the typical weekday logistics warehouse operation over a 24-hour period consisting of buildings with over 150 loading bays (docks). The reference noise level measurement collected at this location was 69.1 dBA Leq.

9.3.3 REFERENCE DISTRIBUTION/WAREHOUSE NOISE LEVELS APPLIED IN THE ANALYSIS

The reference noise level measurements used by Urban Crossroads, Inc. for purposes of calculating the proposed Project's expected noise levels represent a worst-case (loudest) high-cube warehouse/distribution center operational noise level under dry storage conditions. To describe the Project-only operational noise levels associated with dry storage at the Orange Show Logistics Center Project, the reference noise level of 69.1 dBA Leq representing unloading/docking activity taken at the VegFresh Farms and FedEx facility is used. This analysis assumes all tenants within the Project's building would be operational 24 hours per day, seven days per week.

Although the actual noise levels at the Project site will depend on the operating characteristics of the building user, the reference noise level of 69.1 dBA Leq for dry storage is used to describe the peak Project operational noise activity since it represents operational characteristics measured at a reference site with characteristics similar to what is expected at the Project site. The reference noise levels shown on Table 9-1 are intended to describe noise level impacts associated with the expected typical warehouse and distribution storage operations at the Project site.

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (h:mm:ss)	Distance From Source (Feet)	Noise Source Height (Feet)	Hourly Activity (Minutes)[3]	Hourly (dBA Leq)
Entry Gate Activity[1]	0:15:00	20'	8'	60	64.0
Unloading/Docking Activity[1]	0:15:00	30'	8'	60	67.2
Distribution/Warehouse Activity[2]	24:00:00	25'	8'	60	69.1

[1] Reference noise level measurements were collected from the existing operations of the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino. The reference noise level measurements were collected on Wednesday, January 7, 2015.
[2] The reference noise level measurements include the daytime and nighttime noise levels associated with idling trucks, delivery truck activities, parking, backup alarms, refrigerated containers or reefers, as well as loading and unloading of dry goods. Reference noise level measurements were collected from the existing 24-hour operations of Veg Fresh Farms and FedEx distribution facility located at 500 East Orangethorpe Avenue in the City of Anaheim. The reference noise level measurements were collected on Tuesday, January 22, 2013.
[3] Duration (minutes within the hour) of noise activity during peak hourly conditions.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed warehouse operations that include idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. The operational noise level calculations, shown on Table 9-2, 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 (idling trucks, delivery truck activities, parking, backup alarms, loading and unloading of dry goods).

Table 9-2 presents the Project operational noise levels including the barrier attenuation provided by the existing 6-foot high noise barriers in the Project study area and the planned 12-foot high concrete screen wall at the loading dock area of the Project, as shown on Exhibit 9-A. In addition, the Project site plan strategically locates the loading dock areas away from the nearby noise-sensitive residential receivers, south of the building and away from nearby residential homes located north of the site. By placing the loading docks behind the building, the building itself effectively acts as a noise barrier, blocking the line of sight between the loading dock and the receiver locations and substantially reducing the potential noise levels.

To determine the Project-only operational noise levels from dry storage operations, the reference noise level of 69.1 dBA Leq is used to estimate the unloading/docking activity at the Project site. Table 9-2 indicates that the noise levels associated with the Orange Show Logistics Center Project are expected to range from 23.2 to 40.7 dBA Leq at the nearby sensitive receiver locations. The operational noise level calculations are included in Appendix 9.2.

TABLE 9-2: PROJECT OPERATIONAL NOISE LEVEL PROJECTIONS

Receiver Location[1]	Project Noise (dBA Leq)[2]	Distance From Source To Receiver (Feet)[3]	Attenuation (dBA Leq)		Noise Level At Receiver Locations (dBA Leq)[6]
			Distance[4]	Planned Screen Wall & Bldg.[5]	
R1	69.1	524'	-26.4	-18.0	24.7
R2	69.1	444'	-25.0	-18.0	26.1
R3	69.1	410'	-24.3	-18.1	26.7
R4	69.1	625'	-28.0	-17.9	23.2
R5	69.1	221'	-18.9	-9.5	40.7
R6	69.1	449'	-25.1	-9.5	34.5
R7	69.1	1,213'	-33.7	-9.4	26.0
R8	69.1	1,173'	-33.4	-9.6	26.1
R9	69.1	1,509'	-35.6	-9.7	23.8
R10	69.1	1,363'	-34.7	-9.7	24.7
R11	69.1	1,191'	-33.6	-9.6	25.9
R12	69.1	444'	-25.0	-18.0	26.1

[1] See Exhibit 9-A for the noise receiver and noise source locations.
[2] Worst-case Project-only reference noise level from Table 9-1.
[3] Estimated distances to nearest loading dock activities.
[4] Noise levels diminish at a rate 6 dBA per doubling of distance and a reference distance of 30 feet.
[5] Calculated noise attenuation provided by the planned 12-foot high screen wall at the loading docks and the Project building, as shown on Exhibit 9-A.
[6] Estimated Project stationary source noise levels.

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

9.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

The operational noise levels associated with the idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods are shown on Table 9-3 in relation to the City of San Bernardino Development Code noise level standards. Based on the results of the noise analysis, the Project operational noise levels will satisfy the City of San Bernardino Development Code noise level standards at the nearby sensitive receiver locations, and therefore, the operational noise impacts will be *less than significant*.

TABLE 9-3: PROJECT 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	24.7	65	No
R2	26.1	65	No
R3	26.7	65	No
R4	23.2	65	No
R5	40.7	65	No
R6	34.5	65	No
R7	26.0	65	No
R8	26.1	65	No
R9	23.8	65	No
R10	24.7	65	No
R11	25.9	65	No
R12	26.1	65	No

[1] See Exhibit 9-A for the noise receiver and noise source locations.
[2] Estimated Project stationary source noise levels as shown on Table 9-2.
[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?

9.6 PROJECT OPERATIONAL NOISE CONTRIBUTION

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

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

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level contributions to the existing ambient noise environment. 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 9-4 and 9-5.

As indicated on Tables 9-4 and 9-5, the Project will not contribute a daytime or nighttime stationary-source noise level increase at the nearby sensitive receiver locations. 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 9-4: PROJECT DAYTIME NOISE LEVEL CONTRIBUTIONS

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	24.7	L2	56.9	56.9	0.0	No
R2	26.1	L2	58.7	58.7	0.0	No
R3	26.7	L2	58.7	58.7	0.0	No
R4	23.2	L1	58.7	58.7	0.0	No
R5	40.7	L6	70.8	70.8	0.0	No
R6	34.5	L6	70.8	70.8	0.0	No
R7	26.0	L7	72.3	72.3	0.0	No
R8	26.1	L8	58.9	58.9	0.0	No
R9	23.8	L4	67.9	67.9	0.0	No
R10	24.7	L3	69.4	69.4	0.0	No
R11	25.9	L3	69.4	69.4	0.0	No
R12	26.1	L2	58.7	58.7	0.0	No

[1] See Exhibit 9-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 9-3.
[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 9-5: PROJECT NIGHTTIME NOISE LEVEL CONTRIBUTIONS

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	24.7	L2	56.9	56.9	0.0	No
R2	26.1	L2	56.9	56.9	0.0	No
R3	26.7	L2	56.9	56.9	0.0	No
R4	23.2	L1	56.9	56.9	0.0	No
R5	40.7	L6	67.1	67.1	0.0	No
R6	34.5	L6	67.1	67.1	0.0	No
R7	26.0	L7	68.6	68.6	0.0	No
R8	26.1	L8	57.7	57.7	0.0	No
R9	23.8	L4	65.6	65.6	0.0	No
R10	24.7	L3	66.9	66.9	0.0	No
R11	25.9	L3	66.9	66.9	0.0	No
R12	26.1	L2	56.9	56.9	0.0	No

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

9.7 OPERATIONAL NOISE ABATEMENT MEASURES

The normal operation of the Project will not exceed the City of San Bernardino Development Code standards for stationary-source noise impacts. To further reduce potential operational noise levels received at nearby noise-sensitive receiver locations, it is recommended that the Lead Agency require the following as Project Conditions of Approval:

- All on-site operating equipment under the control of the building user that is used in outdoor areas (including but not limited to trucks, tractors, forklifts, and hostlers), shall be operated with properly functioning and well-maintained mufflers.
- Maintain quality pavement conditions on the property that are free of vertical deflection (i.e. speed bumps) to minimize truck noise.
- The truck access gates and loading docks within the truck court on the Project site shall be posted with signs which state:
    - Truck drivers shall turn off engines when not in use;
    - Diesel trucks servicing the Project shall not idle for more than five (5) minutes; and
    - Post telephone numbers of the building facilities manager to report idling violations.

9.8 OPERATIONAL VIBRATION IMPACTS

To assess the potential vibration impacts from truck haul trips associated with operational activities, the City of San Bernardino threshold for vibration of 1.5 in/sec (RMS) is used. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. Typical vibration levels for the Orange Show Logistics Center heavy truck activity at normal traffic speeds will approach 0.001 in/sec (RMS), based on the FTA *Transit Noise Impact and Vibration Assessment*. Truck deliveries transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts at nearby homes will not exceed the vibration threshold of 1.5 in/sec (RMS), and therefore, will be *less than significant*.

10 CONSTRUCTION IMPACTS

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

10.1 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.* (12) 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.

10.2 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 10.1, represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 72 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 *Orange Show Logistics Center Air Quality Impact Analysis* prepared by Urban Crossroads Inc. (20)

10.3 CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 10-1 provides a summary of the sixteen construction reference noise level measurements. Since the reference noise levels were collected at varying distances of 30 feet and 50 feet, all construction noise level measurements presented on Table 10-1 have been adjusted for consistency to describe a common reference distance of 50 feet. Appendix 10.1 includes a detailed construction reference noise level memo and reference noise source photos for each type of construction activity.

TABLE 10-1: 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).

10.4 CONSTRUCTION NOISE ANALYSIS

Tables 10-2 to 10-6 show the Project construction stages and the reference construction noise levels used for each stage. Table 10-7 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 47.1 to 88.9 dBA Leq.

TABLE 10-2: SITE PREPARATION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Water Truck Pass-By & Backup Alarm	71.9
Dozer Pass-By	79.6
Two Scrapers & Water Truck Pass-By	79.0
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	91'	-5.2	0.0	74.4
R2	95'	-5.6	0.0	74.0
R3	82'	-4.3	0.0	75.3
R4	177'	-11.0	0.0	68.6
R5	17'	9.4	0.0	88.9
R6	245'	-13.8	0.0	65.8
R7	1,005'	-26.1	0.0	53.5
R8	1,083'	-26.7	0.0	52.8
R9	1,348'	-28.6	0.0	50.9
R10	1,185'	-27.5	-5.0	47.1
R11	889'	-25.0	0.0	54.6
R12	39'	2.2	0.0	81.7

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).
[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 10-3: GRADING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Rough Grading Activities	73.5
Dozer Pass-By	79.6
Two Scrapers & Water Truck Pass-By	79.0
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	91'	-5.2	0.0	74.4
R2	95'	-5.6	0.0	74.0
R3	82'	-4.3	0.0	75.3
R4	177'	-11.0	0.0	68.6
R5	17'	9.4	0.0	88.9
R6	245'	-13.8	0.0	65.8
R7	1,005'	-26.1	0.0	53.5
R8	1,083'	-26.7	0.0	52.8
R9	1,348'	-28.6	0.0	50.9
R10	1,185'	-27.5	-5.0	47.1
R11	889'	-25.0	0.0	54.6
R12	39'	2.2	0.0	81.7

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).
[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 10-4: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Foundation Trenching	68.2
Water Truck Pass-By & Backup Alarm	71.9
Peak Reference Noise Level at 50 Feet (dBA Leq):	71.9

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	91'	-5.2	0.0	66.7
R2	95'	-5.6	0.0	66.3
R3	82'	-4.3	0.0	67.6
R4	177'	-11.0	0.0	60.9
R5	17'	9.4	0.0	81.2
R6	245'	-13.8	0.0	58.1
R7	1,005'	-26.1	0.0	45.8
R8	1,083'	-26.7	0.0	45.1
R9	1,348'	-28.6	0.0	43.2
R10	1,185'	-27.5	-5.0	39.4
R11	889'	-25.0	0.0	46.9
R12	39'	2.2	0.0	74.0

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).
[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 10-5: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA Leq)
Foundation Trenching	68.2
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	91'	-5.2	0.0	63.0
R2	95'	-5.6	0.0	62.6
R3	82'	-4.3	0.0	63.9
R4	177'	-11.0	0.0	57.2
R5	17'	9.4	0.0	77.5
R6	245'	-13.8	0.0	54.4
R7	1,005'	-26.1	0.0	42.1
R8	1,083'	-26.7	0.0	41.4
R9	1,348'	-28.6	0.0	39.5
R10	1,185'	-27.5	-5.0	35.7
R11	889'	-25.0	0.0	43.2
R12	39'	2.2	0.0	70.3

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).
[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 10-6: 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 Pour & Paving Activities	65.9
Concrete Mixer Backup Alarms & Air Brakes	71.6
Concrete Mixer Pour Activities	67.7
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	91'	-5.2	0.0	66.4
R2	95'	-5.6	0.0	66.0
R3	82'	-4.3	0.0	67.3
R4	177'	-11.0	0.0	60.6
R5	17'	9.4	0.0	81.0
R6	245'	-13.8	0.0	57.8
R7	1,005'	-26.1	0.0	45.5
R8	1,083'	-26.7	0.0	44.9
R9	1,348'	-28.6	0.0	43.0
R10	1,185'	-27.5	-5.0	39.1
R11	889'	-25.0	0.0	46.6
R12	39'	2.2	0.0	73.8

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).
[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 10-7: 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	74.4	74.4	66.7	63.0	66.4	74.4
R2	74.0	74.0	66.3	62.6	66.0	74.0
R3	75.3	75.3	67.6	63.9	67.3	75.3
R4	68.6	68.6	60.9	57.2	60.6	68.6
R5	88.9	88.9	81.2	77.5	81.0	88.9
R6	65.8	65.8	58.1	54.4	57.8	65.8
R7	53.5	53.5	45.8	42.1	45.5	53.5
R8	52.8	52.8	45.1	41.4	44.9	52.8
R9	50.9	50.9	43.2	39.5	43.0	50.9
R10	47.1	47.1	39.4	35.7	39.1	47.1
R11	54.6	54.6	46.9	43.2	46.6	54.6
R12	81.7	81.7	74.0	70.3	73.8	81.7

[1] Noise receiver locations are shown on Exhibit 8-A.
[2] Estimated construction noise levels during peak operating conditions.

10.5 CONSTRUCTION NOISE ABATEMENT MEASURES

Construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts. The following practices would reduce any temporary and intermittent noise level increases produced by the construction equipment audible to the nearby noise-sensitive residential land uses. Prior to approval of grading plans and/or issuance of building permits, plans shall include the following notes. The Project construction supervisor shall ensure compliance with the notes and the City shall conduct periodic inspection at its discretion.

- Noise-generating Project construction activities shall only occur between the hours of 7:00 a.m. and 8:00 p.m. on any day, as specified in the City of San Bernardino Noise Ordinance.
- The construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards.
- No stationary construction equipment shall be placed within 500 feet of residential homes and other noise-sensitive receivers. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise-sensitive receivers nearest the Project site.
- The construction contractor shall locate equipment staging in the southern central portion of the property, which is the area that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site.
- The construction contractor shall schedule haul truck deliveries to occur during the same hours specified for construction equipment (between the hours of 7:00 a.m. and 8:00 p.m. on any day) and design haul truck delivery routes to minimize the use of roads that pass by noise-sensitive land uses.

- The solid perimeter walls proposed at the north, east, and west property boundaries shall be erected as early in the construction process as feasible. (Once erected these walls will act as noise attenuation barriers.)

10.6 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 and paving. Using the vibration source level of construction equipment provided on Table 6-9 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-8 presents the expected Project related vibration levels at the twelve receiver locations.

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference velocity of 0.089 in/sec (PPV) at a distance of 25 feet. At distances ranging from 17 to 1,348 feet from the Project site, construction vibration velocity levels are expected to approach 0.159 in/sec (PPV), as shown on Table 10-8. In order to assess the human perception of vibration levels in PPV, the velocities are converted to RMS vibration levels based on the Caltrans *Transportation and Construction Vibration Guidance Manual* conversion factor of 0.71. Table 10-8 shows the construction vibration levels in RMS are expected to approach 0.113 in/sec (RMS) at the twelve receiver locations. Based on the City of San Bernardino vibration standard of 1.5 in/sec, the construction-related vibration impacts are considered *less than significant.*

Further, vibration levels 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 at the Project site perimeter. Moreover, construction at the Project site will be restricted to daytime hours consistent with City of San Bernardino requirements thereby eliminating potential vibration impacts during the sensitive nighttime hours.

TABLE 11-8: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver[1]	Distance To Const. Activity (Feet)	Receiver PPV Levels (in/sec)[2]					RMS Velocity Levels (in/sec)[3]	Threshold Exceeded?[4]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Peak Vibration		
R1	91'	0.00	0.01	0.01	0.01	0.01	0.01	No
R2	95'	0.00	0.00	0.01	0.01	0.01	0.01	No
R3	82'	0.00	0.01	0.01	0.01	0.01	0.01	No
R4	177'	0.00	0.00	0.00	0.00	0.00	0.00	No
R5	17'	0.01	0.06	0.14	0.16	0.16	0.11	No
R6	245'	0.00	0.00	0.00	0.00	0.00	0.00	No
R7	1,005'	0.00	0.00	0.00	0.00	0.00	0.00	No
R8	1,083'	0.00	0.00	0.00	0.00	0.00	0.00	No
R9	1,348'	0.00	0.00	0.00	0.00	0.00	0.00	No
R10	1,185'	0.00	0.00	0.00	0.00	0.00	0.00	No
R11	889'	0.00	0.00	0.00	0.00	0.00	0.00	No
R12	39'	0.00	0.02	0.04	0.05	0.05	0.03	No

[1] Receiver locations are shown on Exhibit 8-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-9.
[3] Vibration levels in PPV are converted to RMS velocity using a 0.71 conversion factor identified in the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.
[4] Does the peak vibration exceed the City of San Bernardino maximum acceptable vibration threshold shown on Table 3-3?

11 REFERENCES

1. **Urban Crossroads, Inc.** *Orange Show Logistics Center Traffic Impact Analysis.* December 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 Guidelines.* October 2003.
9. **State of California.** *2013 California Green Building Standards Code.* January 2014.
10. **City of San Bernardino.** *General Plan, Noise Element.* November 2005.
11. —. *Municipal Code, Title 19, Article III, Chapter 19.20 - Property Development Standards.*
12. —. *Municipal Code, Title 8, Section 8.54 - Noise Control.*
13. **California Department of Transportation.** *Transportation and Construction-Induced Vibration Guidance Manual.* September 2013.
14. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
15. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
16. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
17. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
18. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.
19. **Urban Crossroads, Inc.** *Alliance California Gateway South Building 3 Noise Impact Analysis.* November 2013.
20. —. *Orange Show Logistics Center Air Quality Impact Analysis.* December 2015.

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12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Orange Show Logistics Center Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5979.

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STATEMENT OF QUALIFICATIONS

Bill Lawson is a Registered Professional Traffic Engineer and a Certified Acoustical Consultant. His educational background includes a Master's Degree in Civic and Environmental Engineering and a Bachelor's Degree in City and Regional Planning from Cal Poly San Luis Obispo. Mr. Lawson maintains a wide range of technical expertise that includes transportation planning, traffic engineering, neighborhood traffic control, and noise impact analysis.

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

Section | Page

19.20.010 Purpose III-19.20-1
19.20.020 Applicability III-19.20-1
19.20.030 General Standards III-19.20-1

Tables

20.01 Fences, Walls, Hedges Height and Type Limits III-19.20-8

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.
8.54.020 Prohibited Acts.
8.54.030 Issuance of Written Notice and Impoundment.
8.54.040 Cost Recovery for Second Response.
8.54.050 Controlled Hours of Operation.
8.54.060 Exemptions.
8.54.070 Disturbances From Construction Activity.
8.54.080 Violation - Penalty
8.54.090 Severability.

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, 4' 52.991600", 117, 16' 24.402400"

L1_NE
34, 4' 52.991600", 117, 16' 24.402400"

L1_S
34, 4' 53.074000", 117, 16' 24.786900"

L1_SE
34, 4' 53.074000", 117, 16' 24.786900"

L1_W
34, 4' 52.991600", 117, 16' 24.402400"

L2
34, 4' 52.662000", 117, 16' 24.759500"

L2_NE
34, 4' 52.648300", 117, 16' 25.501000"

L2_SE
34, 4' 52.648300", 117, 16' 25.501000"

L2_SW
34, 4' 52.648300", 117, 16' 25.501000"

L2_W
34, 4' 52.648300", 117, 16' 25.501000"

L3
34, 4' 46.111400", 117, 16' 46.045500"

L3_N
34, 4' 47.471000", 117, 16' 50.440000"

L3_NE
34, 4' 47.471000", 117, 16' 50.440000"

L3_S
34, 4' 47.471000", 117, 16' 50.440000"

L3_SW
34, 4' 47.471000", 117, 16' 50.440000"

L3_W
34, 4' 47.471000", 117, 16' 50.440000"

L4
34, 4' 45.493400", 117, 16' 44.315100"

L4_N
34, 4' 45.479700", 117, 16' 44.232700"

L4_S
34, 4' 45.479700", 117, 16' 44.232700"

L4_S2
34, 4' 45.479700", 117, 16' 44.232700"

L4_W
34, 4' 45.493400", 117, 16' 44.315100"

L5
34, 4' 47.553400", 117, 16' 23.221400"

L5_E
34, 4' 47.553400", 117, 16' 23.221400"

L5_N
34, 4' 47.155100", 117, 16' 23.633400"

L5_NE
34, 4' 55.930400", 117, 16' 35.993000"

L5_NW
34, 4' 47.553400", 117, 16' 23.221400"

L5_S
34, 4' 47.155100", 117, 16' 23.633400"

L5_SE
34, 4' 47.155100", 117, 16' 23.633400"

L5_SE2
34, 4' 47.155100", 117, 16' 23.633400"

L5_SW
34, 4' 47.155100", 117, 16' 23.633400"

L5_W
34, 4' 47.155100", 117, 16' 23.633400"

L6
34, 4' 47.580800", 117, 16' 21.683300"

L6_E
34, 4' 47.580800", 117, 16' 21.683300"

L6_N
34, 4' 47.580800", 117, 16' 21.683300"

L6_NW
34, 4' 47.580800", 117, 16' 21.683300"

L6_S
34, 4' 47.580800", 117, 16' 21.683300"

L6_W
34, 4' 47.580800", 117, 16' 21.683300"

L7
34, 4' 35.729300", 117, 16' 39.948100"

L7_E
34, 4' 46.427300", 117, 16' 10.120200"

L7_N
34, 4' 46.427300", 117, 16' 10.120200"

L7_NE
34, 4' 46.427300", 117, 16' 10.120200"

L7_S
34, 4' 46.427300", 117, 16' 10.120200"

L7_SE
34, 4' 46.427300", 117, 16' 10.120200"

L7_W
34, 4' 46.427300", 117, 16' 10.120200"

L8
34, 4' 35.729300", 117, 16' 39.948100"

L8_E
34, 4' 35.729300", 117, 16' 39.948100"

L8_N
34, 4' 35.784300", 117, 16' 39.975500"

L8_NW
34, 4' 35.784300", 117, 16' 39.975500"

L8_NW2
34, 4' 35.784300", 117, 16' 39.975500"

L8_SE
34, 4' 35.729300", 117, 16' 39.948100"

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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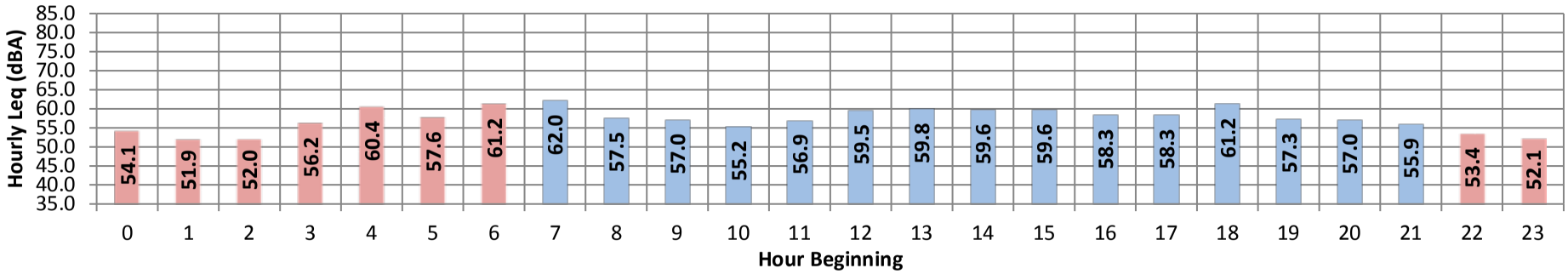
24-Hour Noise Level Measurement Summary

Project Name:	Orange Show Logistics Center	*JN:*	9926	*Energy Average Leq*		*24-Hour*
Location:	L1 - Located north of the Project site across Norman Road at a vacant lot designated as light industrial land use.	*Analyst:*	A. Wolfe	*Day*	*Night*	*CNEL*
		Date:	10/21/2015	58.7	56.9	63.8

Hourly Leq dBA Readings (unadjusted)



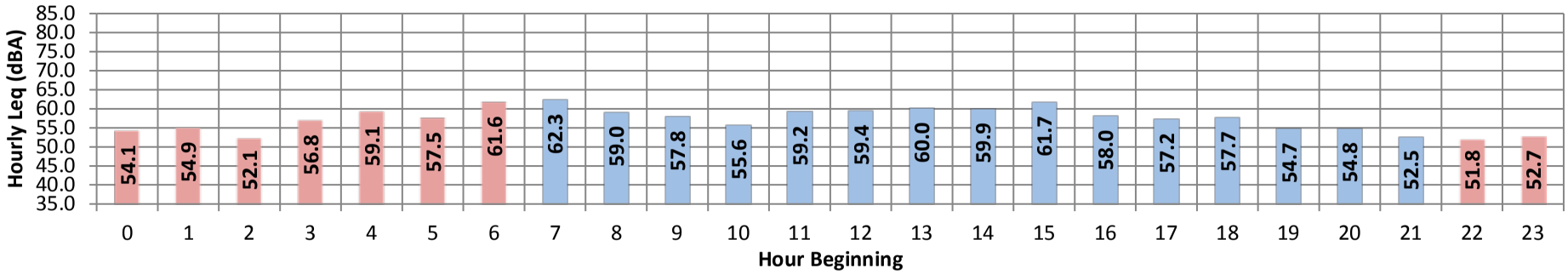
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	55.2	76.5	44.4	67.0	64.0	58.0	55.0	51.0	49.0	46.0	46.0	45.0
	Max	62.0	88.0	52.4	73.0	71.0	68.0	65.0	58.0	56.0	54.0	53.0	53.0
Energy Average:		58.7	Average:		69.9	66.9	61.7	58.7	53.5	51.3	48.6	48.2	47.3
Night	Min	51.9	67.7	44.9	56.0	55.0	53.0	52.0	50.0	49.0	46.0	46.0	45.0
	Max	61.2	84.1	53.7	72.0	69.0	64.0	62.0	58.0	57.0	55.0	54.0	54.0
Energy Average:		56.9	Average:		64.1	60.7	56.9	55.4	53.1	51.9	49.7	49.3	48.7
Hourly Summary													
Night	0	54.1	81.0	44.9	62.0	59.0	57.0	55.0	51.0	49.0	46.0	46.0	45.0
	1	51.9	74.8	47.0	56.0	55.0	53.0	52.0	51.0	50.0	48.0	48.0	47.0
	2	52.0	67.7	46.7	58.0	56.0	54.0	53.0	52.0	51.0	48.0	48.0	47.0
	3	56.2	80.7	48.8	66.0	60.0	55.0	54.0	53.0	52.0	50.0	49.0	49.0
	4	60.4	83.8	50.5	72.0	65.0	59.0	57.0	56.0	54.0	52.0	52.0	51.0
	5	57.6	76.8	51.1	68.0	64.0	59.0	58.0	56.0	55.0	53.0	52.0	51.0
	6	61.2	84.1	53.7	72.0	69.0	64.0	62.0	58.0	57.0	55.0	54.0	54.0
Day	7	62.0	81.1	52.4	73.0	71.0	68.0	65.0	58.0	56.0	54.0	53.0	53.0
	8	57.5	77.9	46.1	69.0	65.0	62.0	60.0	54.0	52.0	48.0	47.0	46.0
	9	57.0	82.6	44.4	69.0	66.0	59.0	56.0	52.0	49.0	46.0	46.0	45.0
	10	55.2	77.0	45.8	67.0	64.0	58.0	55.0	51.0	50.0	48.0	47.0	46.0
	11	56.9	79.2	44.9	69.0	66.0	61.0	58.0	53.0	51.0	48.0	47.0	46.0
	12	59.5	84.2	47.7	71.0	68.0	61.0	59.0	55.0	52.0	49.0	49.0	48.0
	13	59.8	80.5	48.3	71.0	69.0	64.0	62.0	54.0	52.0	50.0	49.0	49.0
	14	59.6	82.4	47.5	71.0	68.0	62.0	58.0	55.0	52.0	50.0	49.0	48.0
	15	59.6	88.0	45.4	71.0	67.0	62.0	58.0	52.0	50.0	47.0	47.0	46.0
	16	58.3	83.6	45.0	70.0	67.0	62.0	59.0	53.0	50.0	47.0	47.0	46.0
	17	58.3	83.0	46.1	70.0	67.0	61.0	58.0	53.0	51.0	48.0	48.0	47.0
	18	61.2	86.0	46.2	72.0	69.0	64.0	60.0	54.0	52.0	48.0	48.0	47.0
	19	57.3	78.3	48.1	69.0	67.0	62.0	59.0	53.0	51.0	49.0	49.0	48.0
	20	57.0	79.9	48.3	69.0	65.0	60.0	57.0	53.0	51.0	49.0	49.0	48.0
	21	55.9	76.5	47.1	68.0	65.0	59.0	57.0	52.0	50.0	48.0	48.0	47.0
Night	22	53.4	73.3	47.3	62.0	60.0	56.0	55.0	51.0	50.0	48.0	48.0	47.0
	23	52.1	75.2	46.3	61.0	58.0	55.0	53.0	50.0	49.0	47.0	47.0	47.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Orange Show Logistics Center	*JN:*	9926	*Energy Average Leq*		*24-Hour*
Location:	L2 - Located adjacent to the northern Project site boundary near existing residential homes on Norman Road.	*Analyst:*	A. Wolfe	*Day*	*Night*	*CNEL*
		Date:	10/21/2015	58.7	56.9	63.7

Hourly Leq dBA Readings (unadjusted)



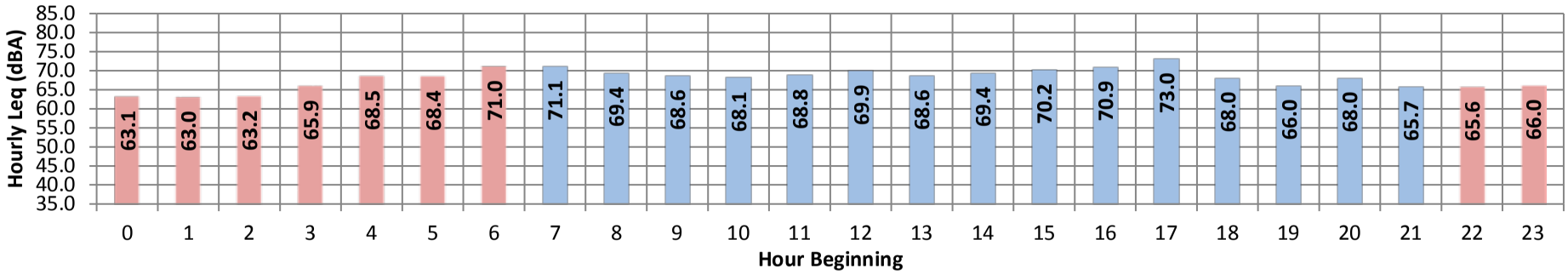
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	52.5	72.5	44.1	64.0	62.0	56.0	53.0	48.0	47.0	45.0	45.0	44.0
	Max	62.3	90.2	54.0	72.0	71.0	68.0	66.0	59.0	57.0	55.0	55.0	55.0
Energy Average:		58.7	Average:		69.1	66.5	61.5	58.7	53.2	51.0	48.5	47.9	47.2
Night	Min	51.8	62.3	44.1	58.0	56.0	54.0	52.0	49.0	48.0	46.0	46.0	45.0
	Max	61.6	84.3	53.5	72.0	69.0	64.0	62.0	58.0	57.0	55.0	55.0	54.0
Energy Average:		56.9	Average:		65.0	61.6	57.1	55.6	53.0	51.8	49.8	49.4	48.7
Hourly Summary													
Night	0	54.1	77.6	45.6	64.0	62.0	57.0	55.0	50.0	49.0	47.0	47.0	46.0
	1	54.9	73.9	48.1	60.0	58.0	57.0	56.0	55.0	52.0	50.0	49.0	49.0
	2	52.1	62.3	47.0	58.0	56.0	54.0	53.0	52.0	51.0	48.0	48.0	47.0
	3	56.8	84.3	47.5	66.0	60.0	55.0	54.0	53.0	52.0	50.0	49.0	48.0
	4	59.1	81.6	50.6	71.0	65.0	58.0	57.0	55.0	54.0	52.0	51.0	51.0
	5	57.5	78.5	51.6	68.0	64.0	59.0	58.0	56.0	55.0	53.0	53.0	52.0
	6	61.6	82.8	53.5	72.0	69.0	64.0	62.0	58.0	57.0	55.0	55.0	54.0
Day	7	62.3	80.0	54.0	72.0	71.0	68.0	66.0	59.0	57.0	55.0	55.0	55.0
	8	59.0	78.6	47.6	69.0	67.0	65.0	63.0	56.0	53.0	50.0	49.0	48.0
	9	57.8	79.2	45.4	70.0	68.0	62.0	58.0	53.0	51.0	48.0	47.0	46.0
	10	55.6	77.5	46.2	68.0	65.0	58.0	55.0	52.0	50.0	48.0	48.0	47.0
	11	59.2	84.1	46.0	70.0	67.0	63.0	60.0	55.0	52.0	49.0	48.0	47.0
	12	59.4	78.6	49.1	70.0	67.0	63.0	61.0	57.0	55.0	51.0	51.0	50.0
	13	60.0	81.4	48.3	71.0	68.0	64.0	62.0	56.0	53.0	51.0	50.0	50.0
	14	59.9	81.4	47.4	72.0	68.0	63.0	60.0	56.0	53.0	50.0	49.0	48.0
	15	61.7	90.2	45.6	71.0	67.0	61.0	58.0	53.0	51.0	48.0	47.0	46.0
	16	58.0	82.7	44.9	70.0	67.0	61.0	58.0	52.0	50.0	47.0	47.0	46.0
	17	57.2	83.2	45.2	68.0	66.0	60.0	57.0	52.0	50.0	47.0	47.0	46.0
	18	57.7	80.2	44.9	69.0	67.0	61.0	58.0	51.0	49.0	47.0	46.0	45.0
	19	54.7	74.8	44.8	67.0	65.0	60.0	56.0	49.0	47.0	46.0	45.0	45.0
	20	54.8	78.9	44.5	66.0	63.0	58.0	55.0	49.0	47.0	46.0	45.0	45.0
	21	52.5	72.5	44.1	64.0	62.0	56.0	53.0	48.0	47.0	45.0	45.0	44.0
Night	22	51.8	72.2	44.1	62.0	58.0	54.0	52.0	49.0	48.0	46.0	46.0	45.0
	23	52.7	75.2	46.1	64.0	62.0	56.0	53.0	49.0	48.0	47.0	47.0	46.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Orange Show Logistics Center	*JN:*	9926	*Energy Average Leq*		*24-Hour*
Location:	L3 - Located west of the Project site on Orange Show Road at existing residential homes.	*Analyst:*	A. Wolfe	*Day*	*Night*	*CNEL*
		Date:	10/21/2015	69.4	66.9	74.0

Hourly Leq dBA Readings (unadjusted)



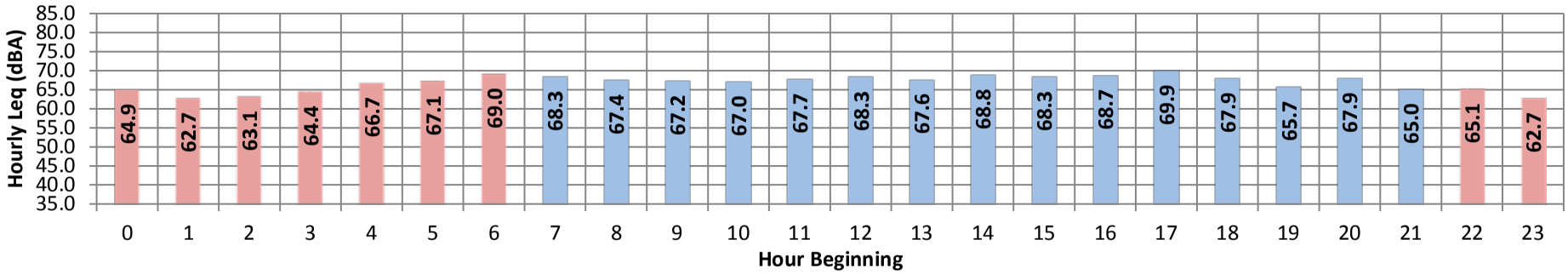
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	65.7	83.5	46.1	76.0	75.0	72.0	69.0	63.0	57.0	52.0	50.0	48.0
	Max	73.0	98.9	52.9	81.0	79.0	76.0	75.0	72.0	66.0	58.0	56.0	53.0
Energy Average:		69.4	Average:		78.9	77.0	74.3	72.9	67.9	62.1	54.1	52.7	50.9
Night	Min	63.0	82.2	45.9	75.0	72.0	69.0	66.0	56.0	52.0	49.0	48.0	47.0
	Max	71.0	96.6	54.4	80.0	78.0	76.0	74.0	69.0	65.0	58.0	57.0	56.0
Energy Average:		66.9	Average:		77.2	75.0	71.8	69.6	62.3	57.3	52.3	51.3	50.2
Hourly Summary													
Night	0	63.1	83.0	45.9	76.0	73.0	69.0	66.0	56.0	52.0	49.0	48.0	47.0
	1	63.0	85.0	47.1	75.0	73.0	69.0	66.0	58.0	53.0	50.0	49.0	48.0
	2	63.2	84.7	48.4	75.0	72.0	69.0	66.0	58.0	54.0	51.0	50.0	49.0
	3	65.9	82.2	48.8	78.0	76.0	72.0	70.0	62.0	56.0	51.0	50.0	49.0
	4	68.5	85.5	50.6	79.0	77.0	75.0	73.0	67.0	61.0	55.0	54.0	53.0
	5	68.4	87.5	51.3	78.0	77.0	74.0	73.0	67.0	62.0	56.0	55.0	53.0
	6	71.0	96.6	54.4	80.0	78.0	76.0	74.0	69.0	65.0	58.0	57.0	56.0
Day	7	71.1	87.1	52.9	80.0	79.0	76.0	75.0	71.0	66.0	57.0	55.0	53.0
	8	69.4	86.4	46.1	79.0	77.0	75.0	74.0	68.0	62.0	52.0	50.0	48.0
	9	68.6	88.3	48.3	79.0	77.0	74.0	73.0	68.0	61.0	53.0	51.0	49.0
	10	68.1	86.1	48.6	79.0	76.0	74.0	72.0	67.0	61.0	52.0	51.0	49.0
	11	68.8	87.0	49.2	79.0	77.0	74.0	73.0	68.0	62.0	54.0	52.0	50.0
	12	69.9	92.6	50.0	80.0	78.0	75.0	73.0	69.0	63.0	54.0	53.0	51.0
	13	68.6	83.9	50.3	78.0	77.0	74.0	73.0	68.0	63.0	54.0	53.0	51.0
	14	69.4	89.4	50.7	79.0	77.0	75.0	73.0	69.0	62.0	54.0	53.0	52.0
	15	70.2	94.3	50.2	80.0	78.0	75.0	74.0	69.0	63.0	54.0	53.0	51.0
	16	70.9	90.0	50.5	80.0	78.0	76.0	75.0	71.0	66.0	56.0	54.0	52.0
	17	73.0	98.9	51.4	81.0	79.0	76.0	75.0	72.0	66.0	58.0	56.0	53.0
	18	68.0	83.5	50.7	78.0	76.0	74.0	73.0	67.0	61.0	54.0	53.0	51.0
	19	66.0	83.6	51.3	76.0	75.0	72.0	71.0	64.0	59.0	53.0	52.0	52.0
	20	68.0	88.8	50.8	78.0	76.0	73.0	71.0	65.0	60.0	53.0	52.0	51.0
	21	65.7	85.8	50.2	77.0	75.0	72.0	69.0	63.0	57.0	53.0	52.0	51.0
Night	22	65.6	85.8	48.4	77.0	75.0	71.0	69.0	62.0	56.0	51.0	50.0	49.0
	23	66.0	91.2	47.2	77.0	74.0	71.0	69.0	62.0	57.0	50.0	49.0	48.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Orange Show Logistics Center	*JN:*	9926	*Energy Average Leq*		*24-Hour*
Location:	L4 - Located in a vacant lot at the southwest corner of Waterman Avenue and Orange Show Road near existing office buildings.	*Analyst:*	A. Wolfe	*Day*	*Night*	*CNEL*
		Date:	10/21/2015	67.9	65.6	72.7

Hourly Leq dBA Readings (unadjusted)



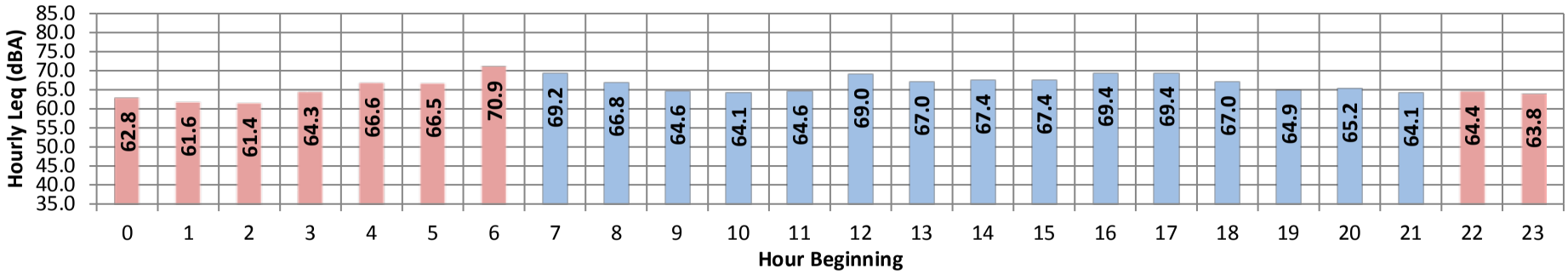
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	65.0	80.7	50.8	74.0	73.0	70.0	69.0	64.0	61.0	55.0	54.0	52.0
	Max	69.9	95.6	56.6	79.0	77.0	74.0	73.0	70.0	66.0	61.0	60.0	58.0
Energy Average:		67.9	Average:		76.5	74.8	72.1	70.8	67.2	63.9	58.5	57.4	55.7
Night	Min	62.7	81.6	46.8	73.0	71.0	68.0	66.0	60.0	55.0	50.0	49.0	47.0
	Max	69.0	91.1	56.1	77.0	76.0	74.0	73.0	69.0	66.0	61.0	60.0	58.0
Energy Average:		65.6	Average:		75.1	73.1	70.1	68.2	63.0	58.8	53.8	52.9	51.3
Hourly Summary													
Night	0	64.9	91.1	47.1	75.0	73.0	69.0	66.0	60.0	55.0	50.0	49.0	48.0
	1	62.7	81.6	47.9	74.0	72.0	68.0	66.0	60.0	55.0	50.0	50.0	48.0
	2	63.1	82.6	49.9	74.0	72.0	68.0	66.0	60.0	56.0	52.0	51.0	50.0
	3	64.4	82.9	51.1	75.0	72.0	69.0	68.0	63.0	59.0	54.0	54.0	52.0
	4	66.7	87.1	52.4	77.0	75.0	72.0	70.0	65.0	61.0	57.0	56.0	54.0
	5	67.1	86.6	55.2	76.0	74.0	72.0	70.0	66.0	63.0	58.0	57.0	56.0
	6	69.0	83.9	56.1	77.0	76.0	74.0	73.0	69.0	66.0	61.0	60.0	58.0
Day	7	68.3	83.4	56.6	76.0	75.0	73.0	72.0	68.0	66.0	61.0	60.0	58.0
	8	67.4	83.5	52.6	77.0	75.0	72.0	71.0	67.0	63.0	58.0	56.0	54.0
	9	67.2	82.7	53.6	76.0	74.0	72.0	71.0	67.0	64.0	58.0	57.0	55.0
	10	67.0	88.1	54.1	75.0	74.0	72.0	70.0	67.0	63.0	58.0	57.0	56.0
	11	67.7	83.0	54.7	76.0	75.0	73.0	71.0	68.0	64.0	59.0	58.0	57.0
	12	68.3	87.2	54.6	78.0	76.0	72.0	71.0	68.0	65.0	59.0	58.0	57.0
	13	67.6	85.5	54.0	76.0	75.0	72.0	71.0	67.0	64.0	59.0	58.0	57.0
	14	68.8	91.6	54.3	77.0	76.0	73.0	72.0	68.0	65.0	60.0	59.0	56.0
	15	68.3	86.7	55.0	77.0	75.0	73.0	71.0	68.0	65.0	59.0	58.0	57.0
	16	68.7	84.7	53.4	77.0	75.0	73.0	72.0	69.0	66.0	60.0	59.0	57.0
	17	69.9	85.1	55.2	79.0	77.0	74.0	73.0	70.0	66.0	61.0	59.0	57.0
	18	67.9	90.6	54.4	77.0	75.0	72.0	70.0	67.0	63.0	58.0	57.0	55.0
	19	65.7	83.2	53.6	75.0	73.0	70.0	69.0	65.0	62.0	57.0	56.0	55.0
	20	67.9	95.6	51.7	77.0	74.0	71.0	69.0	65.0	61.0	56.0	55.0	53.0
	21	65.0	80.7	50.8	74.0	73.0	70.0	69.0	64.0	61.0	55.0	54.0	52.0
Night	22	65.1	88.7	48.2	75.0	73.0	70.0	68.0	63.0	58.0	52.0	50.0	49.0
	23	62.7	81.9	46.8	73.0	71.0	69.0	67.0	61.0	56.0	50.0	49.0	47.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Orange Show Logistics Center	*JN:*	9926	*Energy Average Leq*		*24-Hour*
Location:	L5 - Located at the southern Project site boundary on Orange Show Road north of the Alliance California Gateway South industrial land use.	*Analyst:*	A. Wolfe	*Day*	*Night*	*CNEL*
		Date:	10/21/2015	67.1	65.8	72.6

Hourly Leq dBA Readings (unadjusted)



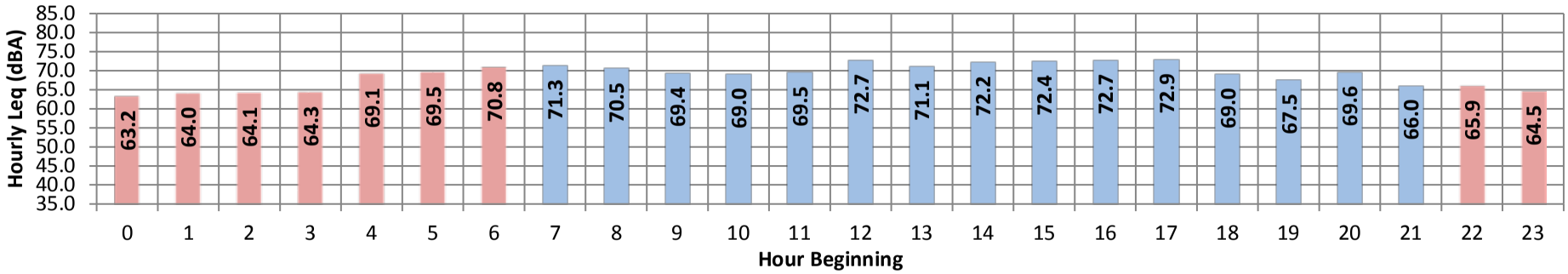
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	64.1	79.1	44.9	74.0	72.0	70.0	67.0	60.0	52.0	48.0	47.0	46.0
	Max	69.4	88.1	54.8	78.0	76.0	74.0	73.0	71.0	66.0	57.0	56.0	55.0
Energy Average:		67.1	Average:		75.9	74.2	72.1	70.6	66.1	60.5	51.6	50.4	48.8
Night	Min	61.4	82.4	43.8	73.0	71.0	66.0	63.0	53.0	49.0	45.0	45.0	44.0
	Max	70.9	93.0	53.9	80.0	78.0	75.0	74.0	70.0	66.0	58.0	55.0	54.0
Energy Average:		65.8	Average:		75.7	73.7	70.3	67.8	59.8	54.3	50.0	49.3	48.4
Hourly Summary													
Night	0	62.8	84.6	43.8	75.0	73.0	69.0	65.0	53.0	49.0	45.0	45.0	44.0
	1	61.6	82.4	46.2	74.0	71.0	67.0	65.0	55.0	50.0	47.0	47.0	46.0
	2	61.4	82.8	45.9	73.0	71.0	66.0	63.0	53.0	51.0	47.0	47.0	46.0
	3	64.3	88.8	49.1	75.0	73.0	70.0	67.0	59.0	52.0	50.0	50.0	49.0
	4	66.6	82.6	49.9	76.0	75.0	73.0	71.0	66.0	59.0	53.0	52.0	51.0
	5	66.5	85.3	52.5	76.0	74.0	72.0	70.0	66.0	60.0	54.0	54.0	53.0
	6	70.9	93.0	53.9	80.0	78.0	75.0	74.0	70.0	66.0	58.0	55.0	54.0
Day	7	69.2	83.0	54.8	78.0	76.0	74.0	73.0	69.0	65.0	57.0	56.0	55.0
	8	66.8	85.0	47.5	76.0	74.0	72.0	71.0	67.0	61.0	51.0	49.0	48.0
	9	64.6	79.1	46.9	74.0	73.0	71.0	69.0	64.0	58.0	50.0	49.0	48.0
	10	64.1	82.7	47.8	74.0	72.0	70.0	68.0	63.0	58.0	50.0	50.0	48.0
	11	64.6	84.2	47.5	74.0	72.0	70.0	69.0	64.0	59.0	51.0	50.0	48.0
	12	69.0	82.9	49.6	77.0	75.0	74.0	73.0	71.0	65.0	53.0	52.0	51.0
	13	67.0	83.8	50.6	76.0	74.0	72.0	70.0	67.0	64.0	56.0	54.0	52.0
	14	67.4	87.3	48.3	77.0	75.0	72.0	71.0	66.0	61.0	53.0	52.0	49.0
	15	67.4	88.1	46.9	76.0	74.0	72.0	71.0	68.0	63.0	51.0	50.0	48.0
	16	69.4	84.6	46.8	77.0	76.0	74.0	73.0	70.0	66.0	55.0	51.0	48.0
	17	69.4	80.4	48.2	77.0	76.0	74.0	73.0	70.0	66.0	54.0	52.0	50.0
	18	67.0	85.3	46.8	76.0	75.0	73.0	71.0	66.0	60.0	49.0	48.0	47.0
	19	64.9	80.2	46.0	75.0	74.0	71.0	70.0	64.0	55.0	48.0	48.0	47.0
	20	65.2	84.4	46.4	76.0	74.0	72.0	70.0	63.0	54.0	48.0	48.0	47.0
	21	64.1	85.0	44.9	75.0	73.0	70.0	67.0	60.0	52.0	48.0	47.0	46.0
Night	22	64.4	86.6	45.5	76.0	74.0	71.0	68.0	59.0	52.0	48.0	47.0	46.0
	23	63.8	84.8	46.8	76.0	74.0	70.0	67.0	57.0	50.0	48.0	47.0	47.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Orange Show Logistics Center	*JN:*	9926	*Energy Average Leq*		*24-Hour*
Location:	L6 - Located at the Project site boundary near the existing residential home at the northwest corner of Lena Road and Orange Show Road.	*Analyst:*	A. Wolfe	*Day*	*Night*	*CNEL*
		Date:	10/22/2015	70.8	67.1	74.5

Hourly Leq dBA Readings (unadjusted)



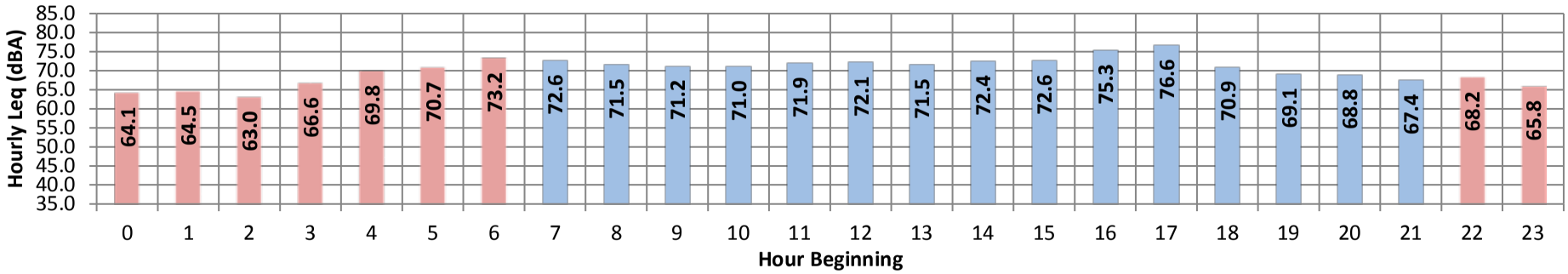
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	66.0	84.7	42.1	78.0	76.0	72.0	69.0	61.0	53.0	47.0	46.0	45.0
	Max	72.9	99.2	52.5	82.0	80.0	78.0	77.0	73.0	69.0	56.0	55.0	54.0
Energy Average:		70.8	Average:		80.3	78.5	76.0	74.5	68.7	62.7	52.2	50.3	48.0
Night	Min	63.2	84.4	41.9	76.0	74.0	68.0	65.0	53.0	49.0	44.0	43.0	42.0
	Max	70.8	92.6	54.4	81.0	79.0	77.0	75.0	70.0	65.0	57.0	56.0	55.0
Energy Average:		67.1	Average:		78.2	76.0	71.9	69.1	60.2	54.2	49.8	48.9	48.2
Hourly Summary													
Night	0	63.2	86.7	45.8	76.0	74.0	68.0	65.0	53.0	50.0	48.0	47.0	46.0
	1	64.0	84.4	45.2	77.0	74.0	69.0	66.0	55.0	50.0	47.0	47.0	46.0
	2	64.1	85.5	45.6	77.0	75.0	70.0	66.0	55.0	50.0	48.0	47.0	47.0
	3	64.3	85.7	49.4	77.0	74.0	70.0	68.0	59.0	53.0	51.0	50.0	50.0
	4	69.1	87.3	51.3	80.0	79.0	76.0	73.0	67.0	59.0	53.0	52.0	52.0
	5	69.5	92.6	51.6	80.0	79.0	75.0	73.0	67.0	60.0	54.0	53.0	52.0
	6	70.8	86.3	54.4	81.0	79.0	77.0	75.0	70.0	65.0	57.0	56.0	55.0
Day	7	71.3	91.4	52.5	81.0	79.0	77.0	76.0	71.0	66.0	56.0	55.0	54.0
	8	70.5	87.2	47.2	80.0	79.0	77.0	76.0	69.0	63.0	52.0	51.0	49.0
	9	69.4	85.1	42.8	80.0	78.0	76.0	74.0	68.0	61.0	50.0	48.0	45.0
	10	69.0	89.3	44.1	79.0	77.0	75.0	74.0	67.0	61.0	50.0	48.0	46.0
	11	69.5	89.4	42.1	80.0	78.0	76.0	74.0	68.0	62.0	52.0	50.0	46.0
	12	72.7	97.9	46.5	82.0	80.0	77.0	76.0	70.0	64.0	53.0	51.0	49.0
	13	71.1	90.9	48.5	81.0	79.0	77.0	75.0	70.0	65.0	56.0	54.0	51.0
	14	72.2	91.5	46.0	81.0	80.0	77.0	76.0	72.0	66.0	54.0	52.0	49.0
	15	72.4	88.0	46.6	81.0	80.0	78.0	77.0	73.0	68.0	55.0	52.0	49.0
	16	72.7	87.6	46.7	81.0	80.0	78.0	77.0	73.0	69.0	56.0	53.0	49.0
	17	72.9	91.9	47.7	82.0	80.0	78.0	77.0	73.0	68.0	55.0	52.0	49.0
	18	69.0	84.7	46.3	79.0	78.0	75.0	74.0	68.0	61.0	51.0	49.0	48.0
	19	67.5	85.9	44.1	79.0	77.0	74.0	72.0	64.0	57.0	48.0	47.0	45.0
	20	69.6	99.2	45.6	80.0	77.0	73.0	71.0	64.0	56.0	48.0	47.0	46.0
	21	66.0	89.5	44.0	78.0	76.0	72.0	69.0	61.0	53.0	47.0	46.0	45.0
Night	22	65.9	85.9	44.0	79.0	76.0	72.0	69.0	58.0	52.0	46.0	45.0	44.0
	23	64.5	86.3	41.9	77.0	74.0	70.0	67.0	58.0	49.0	44.0	43.0	42.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Orange Show Logistics Center	*JN:*	9926	*Energy Average Leq*		*24-Hour*
Location:	L7 - Located southeast of the Project site between the Alliance Gateway South industrial land use and existing residential homes.	*Analyst:*	A. Wolfe	*Day*	*Night*	*CNEL*
		Date:	10/22/2015	72.3	68.6	75.9

Hourly Leq dBA Readings (unadjusted)



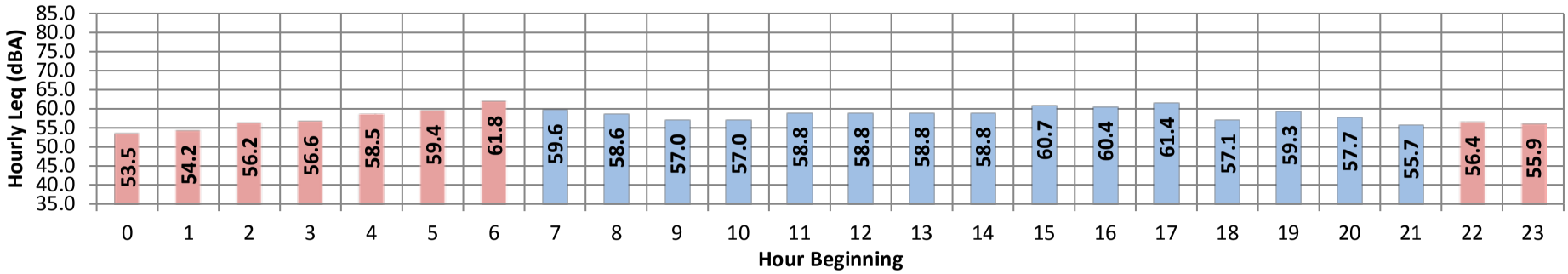
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	67.4	85.9	48.5	79.0	77.0	74.0	71.0	63.0	54.0	50.0	49.0	49.0
	Max	76.6	100.2	53.8	84.0	82.0	80.0	80.0	77.0	73.0	61.0	58.0	55.0
Energy Average:		72.3	Average:		81.7	79.7	77.0	75.5	70.5	64.9	55.3	53.9	52.0
Night	Min	63.0	84.1	47.9	75.0	73.0	68.0	65.0	53.0	50.0	48.0	48.0	48.0
	Max	73.2	96.8	55.6	81.0	80.0	79.0	78.0	74.0	67.0	58.0	57.0	56.0
Energy Average:		68.6	Average:		78.4	76.3	72.7	70.4	61.9	55.8	51.8	51.3	50.7
Hourly Summary													
Night	0	64.1	84.5	48.0	77.0	74.0	69.0	66.0	55.0	50.0	48.0	48.0	48.0
	1	64.5	90.2	48.2	77.0	74.0	69.0	65.0	53.0	51.0	49.0	49.0	48.0
	2	63.0	84.1	49.4	75.0	73.0	68.0	65.0	55.0	52.0	50.0	50.0	49.0
	3	66.6	85.1	50.9	79.0	77.0	73.0	71.0	61.0	54.0	52.0	52.0	51.0
	4	69.8	85.3	51.7	80.0	79.0	76.0	75.0	68.0	60.0	54.0	54.0	52.0
	5	70.7	87.2	53.4	80.0	79.0	77.0	76.0	70.0	63.0	55.0	54.0	54.0
	6	73.2	93.2	55.6	81.0	80.0	79.0	78.0	74.0	67.0	58.0	57.0	56.0
Day	7	72.6	86.9	53.8	81.0	80.0	78.0	77.0	73.0	68.0	58.0	57.0	55.0
	8	71.5	88.4	50.0	82.0	80.0	77.0	75.0	70.0	65.0	56.0	55.0	53.0
	9	71.2	91.6	51.6	81.0	79.0	77.0	75.0	70.0	66.0	56.0	55.0	52.0
	10	71.0	88.2	50.6	81.0	79.0	76.0	75.0	71.0	66.0	55.0	54.0	52.0
	11	71.9	90.1	52.6	82.0	80.0	77.0	76.0	71.0	67.0	57.0	56.0	54.0
	12	72.1	91.5	50.9	82.0	80.0	77.0	76.0	72.0	66.0	56.0	55.0	53.0
	13	71.5	90.8	52.1	81.0	79.0	77.0	75.0	71.0	66.0	56.0	54.0	53.0
	14	72.4	91.3	52.2	83.0	80.0	78.0	76.0	72.0	66.0	57.0	56.0	54.0
	15	72.6	91.9	50.3	82.0	80.0	78.0	76.0	73.0	68.0	55.0	54.0	51.0
	16	75.3	95.4	50.9	83.0	82.0	79.0	78.0	76.0	72.0	61.0	58.0	53.0
	17	76.6	100.2	51.4	84.0	82.0	80.0	80.0	77.0	73.0	58.0	55.0	53.0
	18	70.9	87.4	48.6	82.0	80.0	77.0	76.0	69.0	62.0	52.0	51.0	49.0
	19	69.1	88.2	49.3	81.0	79.0	75.0	73.0	65.0	57.0	51.0	50.0	50.0
	20	68.8	86.5	48.9	81.0	78.0	75.0	73.0	65.0	57.0	51.0	50.0	49.0
	21	67.4	85.9	48.5	79.0	77.0	74.0	71.0	63.0	54.0	50.0	49.0	49.0
Night	22	68.2	96.8	47.9	79.0	76.0	72.0	69.0	61.0	53.0	50.0	49.0	49.0
	23	65.8	87.6	48.7	78.0	75.0	71.0	69.0	60.0	52.0	50.0	49.0	49.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Orange Show Logistics Center	*JN:*	9926	*Energy Average Leq*		*24-Hour*
Location:	L8 - Located south of the Project site on Park Center Drive near the existing InnovAge Senior Care and Inland Regional Center facilities.	*Analyst:*	A. Wolfe	*Day*	*Night*	*CNEL*
		Date:	10/22/2015	58.9	57.7	64.5

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	55.7	69.1	47.2	63.0	62.0	60.0	59.0	55.0	53.0	49.0	48.0	47.0
	Max	61.4	86.8	52.4	70.0	67.0	65.0	63.0	61.0	58.0	56.0	55.0	54.0
Energy Average:		58.9	Average:		65.7	63.9	61.8	60.7	58.1	55.9	52.9	51.9	50.8
Night	Min	53.5	67.7	47.0	62.0	60.0	58.0	56.0	53.0	50.0	48.0	48.0	47.0
	Max	61.8	84.0	56.0	67.0	66.0	65.0	64.0	62.0	61.0	58.0	58.0	56.0
Energy Average:		57.7	Average:		63.6	62.2	60.4	59.2	56.3	54.6	52.1	51.8	50.9
Hourly Summary													
Night	0	53.5	67.8	47.1	62.0	60.0	58.0	56.0	53.0	50.0	48.0	48.0	47.0
	1	54.2	70.8	48.7	62.0	60.0	58.0	57.0	54.0	52.0	50.0	49.0	49.0
	2	56.2	68.4	50.5	62.0	61.0	60.0	59.0	56.0	54.0	52.0	52.0	51.0
	3	56.6	71.2	51.3	62.0	62.0	60.0	59.0	56.0	55.0	53.0	53.0	52.0
	4	58.5	74.4	51.1	64.0	63.0	61.0	60.0	58.0	57.0	54.0	54.0	52.0
	5	59.4	67.7	53.9	65.0	64.0	63.0	62.0	60.0	58.0	56.0	55.0	55.0
	6	61.8	72.5	56.0	67.0	66.0	65.0	64.0	62.0	61.0	58.0	58.0	56.0
Day	7	59.6	71.3	52.4	66.0	64.0	62.0	62.0	60.0	58.0	56.0	55.0	54.0
	8	58.6	81.0	48.8	65.0	63.0	61.0	60.0	58.0	56.0	52.0	51.0	49.0
	9	57.0	71.5	49.8	63.0	62.0	60.0	59.0	57.0	55.0	53.0	52.0	51.0
	10	57.0	69.1	49.4	63.0	62.0	61.0	60.0	57.0	55.0	52.0	52.0	50.0
	11	58.8	79.7	50.0	66.0	64.1	62.0	60.8	58.2	56.1	53.1	52.1	51.1
	12	58.8	79.7	50.0	66.0	64.1	62.0	60.8	58.2	56.1	53.1	52.1	51.1
	13	58.8	79.7	50.0	66.0	64.1	62.0	60.8	58.2	56.1	53.1	52.1	51.1
	14	58.8	79.7	50.0	66.0	64.1	62.0	60.8	58.2	56.1	53.1	52.1	51.1
	15	60.7	80.9	51.8	68.0	66.0	63.0	62.0	60.0	58.0	55.0	54.0	53.0
	16	60.4	77.7	51.4	67.0	66.0	64.0	63.0	60.0	58.0	55.0	53.0	52.0
	17	61.4	82.6	50.0	70.0	67.0	65.0	63.0	61.0	58.0	55.0	54.0	53.0
	18	57.1	72.8	50.3	65.0	63.0	61.0	60.0	57.0	55.0	52.0	51.0	51.0
	19	59.3	86.8	50.0	65.0	63.0	61.0	59.0	57.0	55.0	52.0	51.0	50.0
	20	57.7	78.2	47.3	65.0	63.0	61.0	60.0	56.0	54.0	50.0	48.0	47.0
	21	55.7	70.4	47.2	64.0	63.0	60.0	59.0	55.0	53.0	49.0	49.0	48.0
Night	22	56.4	75.1	48.0	65.0	63.0	61.0	59.0	55.0	53.0	50.0	49.0	49.0
	23	55.9	84.0	47.0	63.0	61.0	58.0	57.0	53.0	51.0	48.0	48.0	47.0

URBAN CROSSROADS

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: Waterman Av.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,957 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,296 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.70	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.46	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.87	0.82	-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	61.1	60.9	68.3	68.5
Medium Trucks:	66.2	64.7	53.5	57.9	65.8	65.9
Heavy Trucks:	72.1	69.7	67.9	65.6	72.8	73.1
Vehicle Noise:	74.3	72.1	68.9	67.4	74.7	75.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	103	222	478	1,030
CNEL:	108	232	500	1,078

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Waterman Av.
Road Segment: s/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,290 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,329 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.59	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.35	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.76	0.82	-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	61.2	61.0	68.4	68.6
Medium Trucks:	66.3	64.8	53.6	58.0	65.9	66.0
Heavy Trucks:	72.2	69.8	68.0	65.7	72.9	73.3
Vehicle Noise:	74.4	72.3	69.0	67.5	74.8	75.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	105	226	486	1,048
CNEL:	110	236	509	1,097

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,418 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	242 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-8.02	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-20.78	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.19	0.82	-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:	58.1	56.2	51.1	50.8	58.3	58.5
Medium Trucks:	56.6	55.0	43.9	48.3	56.2	56.3
Heavy Trucks:	63.4	61.0	59.2	56.9	64.1	64.4
Vehicle Noise:	65.2	63.0	59.9	58.3	65.6	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	55	119	255
CNEL:	27	58	124	268

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Orange Show Rd.
Road Segment: w/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,052 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,405 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.38	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-13.14	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-11.55	0.82	-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:	65.7	63.8	58.7	58.5	66.0	66.2
Medium Trucks:	64.2	62.7	51.5	56.0	63.9	63.9
Heavy Trucks:	71.1	68.6	66.9	64.5	71.7	72.1
Vehicle Noise:	72.8	70.6	67.6	65.9	73.3	73.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	83	178	383	826
CNEL:	87	186	402	865

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Orange Show Rd.
Road Segment: e/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,346	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,235	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.64	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-11.13	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-9.54	0.82	-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:	67.7	65.8	60.7	60.5	68.0	68.2
Medium Trucks:	66.2	64.7	53.5	58.0	65.9	65.9
Heavy Trucks:	73.1	70.7	68.9	66.5	73.7	74.1
Vehicle Noise:	74.8	72.6	69.6	68.0	75.3	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	112	242	522	1,125
CNEL:	118	254	547	1,179

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Orange Show Rd.
Road Segment: e/o E St.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,276	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,728	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.52	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-12.24	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-10.65	0.82	-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:	66.6	64.7	59.6	59.4	66.8	67.1
Medium Trucks:	65.1	63.6	52.4	56.9	64.8	64.8
Heavy Trucks:	72.0	69.5	67.8	65.4	72.6	73.0
Vehicle Noise:	73.7	71.5	68.5	66.8	74.2	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	95	204	440	948
CNEL:	99	214	461	993

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Orange Show Rd.
Road Segment: w/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,055	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,406	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.34	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.11	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.52	0.82	-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	66.5	61.4	61.2	68.7	68.9
Medium Trucks:	66.5	65.0	53.8	58.3	66.2	66.2
Heavy Trucks:	72.5	70.1	68.3	65.9	73.1	73.5
Vehicle Noise:	74.6	72.5	69.2	67.7	75.1	75.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	109	234	505	1,088
CNEL:	114	245	528	1,138

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,430	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,143	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.24	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-15.01	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.42	0.82	-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:	67.6	65.6	60.5	60.3	67.8	68.0
Medium Trucks:	65.6	64.1	52.9	57.4	65.3	65.3
Heavy Trucks:	71.6	69.2	67.4	65.0	72.2	72.6
Vehicle Noise:	73.8	71.6	68.3	66.8	74.2	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	95	204	440	948
CNEL:	99	214	460	992

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 2

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,855	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,186	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.08	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.85	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.26	0.82	-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:	67.7	65.8	60.7	60.5	67.9	68.2
Medium Trucks:	65.8	64.3	53.1	57.6	65.4	65.5
Heavy Trucks:	71.7	69.3	67.5	65.2	72.4	72.8
Vehicle Noise:	73.9	71.8	68.5	67.0	74.3	74.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	97	209	451	971
CNEL:	102	219	472	1,016

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 3

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,855	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,186	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.08	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.85	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.26	0.82	-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:	67.7	65.8	60.7	60.5	67.9	68.2
Medium Trucks:	65.8	64.3	53.1	57.6	65.4	65.5
Heavy Trucks:	71.7	69.3	67.5	65.2	72.4	72.8
Vehicle Noise:	73.9	71.8	68.5	67.0	74.3	74.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	97	209	451	971
CNEL:	102	219	472	1,016

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 4

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,855	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,186	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.08	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.85	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.26	0.82	-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:	67.7	65.8	60.7	60.5	67.9	68.2
Medium Trucks:	65.8	64.3	53.1	57.6	65.4	65.5
Heavy Trucks:	71.7	69.3	67.5	65.2	72.4	72.8
Vehicle Noise:	73.9	71.8	68.5	67.0	74.3	74.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	97	209	451	971
CNEL:	102	219	472	1,016

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 5

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,855	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,186	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.08	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.85	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.26	0.82	-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:	67.7	65.8	60.7	60.5	67.9	68.2
Medium Trucks:	65.8	64.3	53.1	57.6	65.4	65.5
Heavy Trucks:	71.7	69.3	67.5	65.2	72.4	72.8
Vehicle Noise:	73.9	71.8	68.5	67.0	74.3	74.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	97	209	451	971
CNEL:	102	219	472	1,016

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,879	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,088	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.46	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-15.22	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.63	0.82	-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:	67.3	65.4	60.3	60.1	67.6	67.8
Medium Trucks:	65.4	63.9	52.7	57.2	65.1	65.1
Heavy Trucks:	71.4	68.9	67.2	64.8	72.0	72.4
Vehicle Noise:	73.5	71.4	68.1	66.6	74.0	74.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	92	198	426	917
CNEL:	96	207	445	960

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Waterman Av.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,992	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,299	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.59%
Medium Trucks:	84.8%	1.6%	13.5%	4.67%
Heavy Trucks:	68.7%	11.4%	19.9%	6.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.68	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.46	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.87	0.82	-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	61.1	60.9	68.3	68.5
Medium Trucks:	66.2	64.7	53.5	57.9	65.8	65.9
Heavy Trucks:	72.1	69.7	67.9	65.6	72.8	73.1
Vehicle Noise:	74.3	72.2	68.9	67.4	74.7	75.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	103	222	478	1,031
CNEL:	108	232	501	1,079

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Waterman Av.
Road Segment: s/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,370	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,337	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.25%
Medium Trucks:	84.8%	1.6%	13.5%	4.74%
Heavy Trucks:	68.7%	11.4%	19.9%	7.01%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.58	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.28	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.58	0.82	-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	61.2	61.0	68.4	68.7
Medium Trucks:	66.3	64.8	53.7	58.1	66.0	66.1
Heavy Trucks:	72.4	70.0	68.2	65.9	73.1	73.4
Vehicle Noise:	74.5	72.4	69.1	67.6	75.0	75.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	107	230	496	1,069
CNEL:	112	241	519	1,119

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,445	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	245	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.68%
Medium Trucks:	84.8%	1.6%	13.5%	4.63%
Heavy Trucks:	68.7%	11.4%	19.9%	6.68%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-7.96	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-20.78	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.19	0.82	-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:	58.1	56.2	51.1	50.9	58.4	58.6
Medium Trucks:	56.6	55.0	43.9	48.3	56.2	56.3
Heavy Trucks:	63.4	61.0	59.2	56.9	64.1	64.4
Vehicle Noise:	65.2	63.0	60.0	58.3	65.6	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	55	119	256
CNEL:	27	58	124	268

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Orange Show Rd.
Road Segment: w/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,104	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,410	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.39%
Medium Trucks:	84.8%	1.6%	13.5%	4.72%
Heavy Trucks:	68.7%	11.4%	19.9%	6.90%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.37	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-13.09	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-11.45	0.82	-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:	65.7	63.8	58.7	58.5	66.0	66.2
Medium Trucks:	64.2	62.7	51.5	56.0	63.9	64.0
Heavy Trucks:	71.2	68.7	67.0	64.6	71.8	72.2
Vehicle Noise:	72.9	70.7	67.7	66.0	73.3	73.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	180	388	836
CNEL:	88	189	407	876

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Orange Show Rd.
Road Segment: e/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,441	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,244	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.38%
Medium Trucks:	84.8%	1.6%	13.5%	4.72%
Heavy Trucks:	68.7%	11.4%	19.9%	6.90%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.65	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-11.08	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-9.43	0.82	-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:	67.8	65.8	60.7	60.5	68.0	68.2
Medium Trucks:	66.3	64.8	53.6	58.0	65.9	66.0
Heavy Trucks:	73.2	70.8	69.0	66.6	73.8	74.2
Vehicle Noise:	74.9	72.7	69.7	68.0	75.4	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	114	246	529	1,140
CNEL:	119	257	554	1,195

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Orange Show Rd.
Road Segment: e/o E St.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,376	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,738	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.33%
Medium Trucks:	84.8%	1.6%	13.5%	4.72%
Heavy Trucks:	68.7%	11.4%	19.9%	6.94%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.53	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-12.18	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-10.51	0.82	-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:	66.6	64.7	59.6	59.4	66.9	67.1
Medium Trucks:	65.2	63.6	52.5	56.9	64.8	64.9
Heavy Trucks:	72.1	69.7	67.9	65.5	72.8	73.1
Vehicle Noise:	73.8	71.6	68.6	66.9	74.3	74.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	96	208	447	964
CNEL:	101	218	469	1,010

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Orange Show Rd.
Road Segment: w/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,157	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,416	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.29%
Medium Trucks:	84.8%	1.6%	13.5%	4.73%
Heavy Trucks:	68.7%	11.4%	19.9%	6.98%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.33	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.04	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.34	0.82	-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	66.5	61.4	61.2	68.7	68.9
Medium Trucks:	66.6	65.1	53.9	58.4	66.2	66.3
Heavy Trucks:	72.7	70.2	68.5	66.1	73.3	73.7
Vehicle Noise:	74.8	72.6	69.4	67.8	75.2	75.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	111	239	515	1,109
CNEL:	116	250	539	1,161

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Orange Show Rd.
Road Segment: e/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

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:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	87.86%
Medium Trucks:	84.8%	1.6%	13.5%	4.81%
Heavy Trucks:	68.7%	11.4%	19.9%	7.33%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.21	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.83	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.00	0.82	-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:	67.6	65.7	60.5	60.3	67.8	68.0
Medium Trucks:	65.8	64.3	53.1	57.6	65.5	65.5
Heavy Trucks:	72.0	69.6	67.8	65.4	72.7	73.0
Vehicle Noise:	74.0	71.9	68.7	67.1	74.5	74.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	99	214	461	993
CNEL:	104	224	482	1,039

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 2
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,962	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,196	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	87.99%
Medium Trucks:	84.8%	1.6%	13.5%	4.79%
Heavy Trucks:	68.7%	11.4%	19.9%	7.22%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.07	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.71	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.93	0.82	-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:	67.7	65.8	60.7	60.5	67.9	68.2
Medium Trucks:	65.9	64.4	53.2	57.7	65.6	65.6
Heavy Trucks:	72.1	69.6	67.9	65.5	72.7	73.1
Vehicle Noise:	74.1	72.0	68.7	67.2	74.6	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	101	217	467	1,006
CNEL:	105	227	489	1,053

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 3
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,962	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,196	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	87.99%
Medium Trucks:	84.8%	1.6%	13.5%	4.79%
Heavy Trucks:	68.7%	11.4%	19.9%	7.22%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.07	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.71	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.93	0.82	-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:	67.7	65.8	60.7	60.5	67.9	68.2
Medium Trucks:	65.9	64.4	53.2	57.7	65.6	65.6
Heavy Trucks:	72.1	69.6	67.9	65.5	72.7	73.1
Vehicle Noise:	74.1	72.0	68.7	67.2	74.6	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	101	217	467	1,006
CNEL:	105	227	489	1,053

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 4
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,902	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,190	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.43%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.07	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.82	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.17	0.82	-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:	67.7	65.8	60.7	60.5	67.9	68.2
Medium Trucks:	65.8	64.3	53.1	57.6	65.5	65.5
Heavy Trucks:	71.8	69.4	67.6	65.3	72.5	72.8
Vehicle Noise:	74.0	71.8	68.6	67.0	74.4	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	98	211	455	980
CNEL:	103	221	476	1,026

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 5
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,902	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,190	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.43%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.07	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.82	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.17	0.82	-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:	67.7	65.8	60.7	60.5	67.9	68.2
Medium Trucks:	65.8	64.3	53.1	57.6	65.5	65.5
Heavy Trucks:	71.8	69.4	67.6	65.3	72.5	72.8
Vehicle Noise:	74.0	71.8	68.6	67.0	74.4	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	98	211	455	980
CNEL:	103	221	476	1,026

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,929	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,093	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.43%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.44	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-15.19	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.54	0.82	-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:	67.4	65.4	60.3	60.1	67.6	67.8
Medium Trucks:	65.4	63.9	52.7	57.2	65.1	65.2
Heavy Trucks:	71.5	69.0	67.3	64.9	72.1	72.5
Vehicle Noise:	73.6	71.5	68.2	66.7	74.0	74.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	93	200	430	927
CNEL:	97	209	450	970

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Waterman Av.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,746	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,375	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.44	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.20	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.62	0.82	-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	66.4	61.3	61.1	68.6	68.8
Medium Trucks:	66.4	64.9	53.7	58.2	66.1	66.1
Heavy Trucks:	72.4	70.0	68.2	65.8	73.0	73.4
Vehicle Noise:	74.6	72.4	69.1	67.6	75.0	75.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	107	231	497	1,072
CNEL:	112	242	521	1,122

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Waterman Av.
Road Segment: s/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,099	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,410	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.33	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.09	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.51	0.82	-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	66.5	61.4	61.2	68.7	68.9
Medium Trucks:	66.5	65.0	53.8	58.3	66.2	66.3
Heavy Trucks:	72.5	70.1	68.3	65.9	73.1	73.5
Vehicle Noise:	74.7	72.5	69.2	67.7	75.1	75.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	109	235	506	1,090
CNEL:	114	246	529	1,141

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,566 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	257 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-7.76	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-20.53	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.94	0.82	-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:	58.3	56.4	51.3	51.1	58.6	58.8
Medium Trucks:	56.8	55.3	44.1	48.6	56.5	56.5
Heavy Trucks:	63.7	61.3	59.5	57.1	64.3	64.7
Vehicle Noise:	65.4	63.2	60.2	58.6	65.9	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	57	123	266
CNEL:	28	60	129	279

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: w/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,908 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,491 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.12	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-12.88	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-11.29	0.82	-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:	66.0	64.1	58.9	58.7	66.2	66.4
Medium Trucks:	64.5	62.9	51.8	56.2	64.1	64.2
Heavy Trucks:	71.3	68.9	67.1	64.8	72.0	72.3
Vehicle Noise:	73.1	70.9	67.8	66.2	73.5	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	86	185	399	859
CNEL:	90	194	418	900

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,707 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,371 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.89	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-10.87	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-9.28	0.82	-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:	68.0	66.1	61.0	60.8	68.2	68.4
Medium Trucks:	66.5	65.0	53.8	58.2	66.1	66.2
Heavy Trucks:	73.3	70.9	69.1	66.8	74.0	74.4
Vehicle Noise:	75.1	72.9	69.9	68.2	75.5	75.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	117	252	543	1,170
CNEL:	123	264	569	1,226

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o E St.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,328 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,833 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.78	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-11.99	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-10.40	0.82	-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:	66.9	65.0	59.8	59.6	67.1	67.3
Medium Trucks:	65.3	63.8	52.7	57.1	65.0	65.1
Heavy Trucks:	72.2	69.8	68.0	65.7	72.9	73.2
Vehicle Noise:	74.0	71.8	68.7	67.1	74.4	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	99	212	457	986
CNEL:	103	223	480	1,033

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: w/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,911	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,491	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.09	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.85	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.26	0.82	-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	61.7	61.5	68.9	69.1
Medium Trucks:	66.8	65.3	54.1	58.5	66.4	66.5
Heavy Trucks:	72.7	70.3	68.5	66.2	73.4	73.8
Vehicle Noise:	74.9	72.8	69.5	68.0	75.3	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	113	244	525	1,132
CNEL:	118	255	550	1,184

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,126	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,213	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.99	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.75	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.16	0.82	-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:	67.8	65.9	60.8	60.6	68.0	68.2
Medium Trucks:	65.9	64.4	53.2	57.6	65.5	65.6
Heavy Trucks:	71.8	69.4	67.6	65.3	72.5	72.9
Vehicle Noise:	74.0	71.9	68.6	67.1	74.4	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	99	212	458	986
CNEL:	103	222	479	1,032

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 2
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,577	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,258	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.83	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.59	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.00	0.82	-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:	68.0	66.0	60.9	60.7	68.2	68.4
Medium Trucks:	66.0	64.5	53.3	57.8	65.7	65.8
Heavy Trucks:	72.0	69.6	67.8	65.4	72.7	73.0
Vehicle Noise:	74.2	72.0	68.7	67.2	74.6	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	101	218	469	1,010
CNEL:	106	228	491	1,057

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 3
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,577	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,258	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.83	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.59	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.00	0.82	-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:	68.0	66.0	60.9	60.7	68.2	68.4
Medium Trucks:	66.0	64.5	53.3	57.8	65.7	65.8
Heavy Trucks:	72.0	69.6	67.8	65.4	72.7	73.0
Vehicle Noise:	74.2	72.0	68.7	67.2	74.6	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	101	218	469	1,010
CNEL:	106	228	491	1,057

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 4

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,577 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,258 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.83	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.59	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.00	0.82	-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:	68.0	66.0	60.9	60.7	68.2	68.4
Medium Trucks:	66.0	64.5	53.3	57.8	65.7	65.8
Heavy Trucks:	72.0	69.6	67.8	65.4	72.7	73.0
Vehicle Noise:	74.2	72.0	68.7	67.2	74.6	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	101	218	469	1,010
CNEL:	106	228	491	1,057

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 5

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,577 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,258 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.83	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.59	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.00	0.82	-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:	68.0	66.0	60.9	60.7	68.2	68.4
Medium Trucks:	66.0	64.5	53.3	57.8	65.7	65.8
Heavy Trucks:	72.0	69.6	67.8	65.4	72.7	73.0
Vehicle Noise:	74.2	72.0	68.7	67.2	74.6	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	101	218	469	1,010
CNEL:	106	228	491	1,057

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Ambient 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,542 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,154 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.20	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.96	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.37	0.82	-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:	67.6	65.7	60.6	60.3	67.8	68.0
Medium Trucks:	65.7	64.2	53.0	57.4	65.3	65.4
Heavy Trucks:	71.6	69.2	67.4	65.1	72.3	72.6
Vehicle Noise:	73.8	71.6	68.4	66.9	74.2	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	95	206	443	954
CNEL:	100	215	463	998

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Waterman Av.
Road Segment: n/o Orange Show Rd.

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,781 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,378 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.59%
Medium Trucks:	84.8%	1.6%	13.5%	4.67%
Heavy Trucks:	68.7%	11.4%	19.9%	6.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.43	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.20	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.62	0.82	-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	66.4	61.3	61.1	68.6	68.8
Medium Trucks:	66.4	64.9	53.7	58.2	66.1	66.1
Heavy Trucks:	72.4	70.0	68.2	65.8	73.0	73.4
Vehicle Noise:	74.6	72.4	69.1	67.6	75.0	75.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	107	231	498	1,072
CNEL:	112	242	521	1,122

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Waterman Av.
Road Segment: s/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,179	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,418	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.27%
Medium Trucks:	84.8%	1.6%	13.5%	4.74%
Heavy Trucks:	68.7%	11.4%	19.9%	6.99%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.32	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.02	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.33	0.82	-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	61.4	61.2	68.7	68.9
Medium Trucks:	66.6	65.1	53.9	58.4	66.3	66.3
Heavy Trucks:	72.7	70.2	68.5	66.1	73.3	73.7
Vehicle Noise:	74.8	72.6	69.4	67.9	75.2	75.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	111	239	516	1,111
CNEL:	116	251	540	1,163

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,593	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	259	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.68%
Medium Trucks:	84.8%	1.6%	13.5%	4.64%
Heavy Trucks:	68.7%	11.4%	19.9%	6.69%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-7.71	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-20.53	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.94	0.82	-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:	58.4	56.5	51.4	51.1	58.6	58.8
Medium Trucks:	56.8	55.3	44.1	48.6	56.5	56.5
Heavy Trucks:	63.7	61.3	59.5	57.1	64.3	64.7
Vehicle Noise:	65.4	63.3	60.2	58.6	65.9	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	57	124	266
CNEL:	28	60	129	279

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Orange Show Rd.
Road Segment: w/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,960	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,496	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.40%
Medium Trucks:	84.8%	1.6%	13.5%	4.72%
Heavy Trucks:	68.7%	11.4%	19.9%	6.89%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.11	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-12.84	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-11.20	0.82	-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:	66.0	64.1	59.0	58.7	66.2	66.4
Medium Trucks:	64.5	63.0	51.8	56.3	64.2	64.2
Heavy Trucks:	71.4	69.0	67.2	64.9	72.1	72.4
Vehicle Noise:	73.1	71.0	67.9	66.3	73.6	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	87	187	403	869
CNEL:	91	196	423	911

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Orange Show Rd.
Road Segment: e/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,802	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,380	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.39%
Medium Trucks:	84.8%	1.6%	13.5%	4.71%
Heavy Trucks:	68.7%	11.4%	19.9%	6.89%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.90	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-10.83	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-9.17	0.82	-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:	68.0	66.1	61.0	60.8	68.2	68.4
Medium Trucks:	66.5	65.0	53.8	58.3	66.2	66.2
Heavy Trucks:	73.4	71.0	69.2	66.9	74.1	74.5
Vehicle Noise:	75.2	73.0	69.9	68.3	75.6	75.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	118	255	550	1,185
CNEL:	124	268	576	1,242

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Orange Show Rd.
Road Segment: e/o E St.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,428	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,843	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.35%
Medium Trucks:	84.8%	1.6%	13.5%	4.72%
Heavy Trucks:	68.7%	11.4%	19.9%	6.93%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.79	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-11.93	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-10.26	0.82	-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:	66.9	65.0	59.9	59.6	67.1	67.3
Medium Trucks:	65.4	63.9	52.7	57.2	65.1	65.1
Heavy Trucks:	72.3	69.9	68.2	65.8	73.0	73.4
Vehicle Noise:	74.1	71.9	68.9	67.2	74.5	74.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	100	216	465	1,001
CNEL:	105	226	487	1,050

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Orange Show Rd.
Road Segment: w/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,013	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,501	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.30%
Medium Trucks:	84.8%	1.6%	13.5%	4.73%
Heavy Trucks:	68.7%	11.4%	19.9%	6.97%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.07	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.78	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.10	0.82	-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	61.7	61.5	68.9	69.2
Medium Trucks:	66.8	65.3	54.1	58.6	66.5	66.6
Heavy Trucks:	72.9	70.5	68.7	66.3	73.6	73.9
Vehicle Noise:	75.0	72.9	69.6	68.1	75.4	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	115	248	535	1,152
CNEL:	121	260	560	1,206

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Orange Show Rd.
Road Segment: e/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,296	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,230	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	87.90%
Medium Trucks:	84.8%	1.6%	13.5%	4.80%
Heavy Trucks:	68.7%	11.4%	19.9%	7.30%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.96	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.58	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.77	0.82	-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:	67.8	65.9	60.8	60.6	68.1	68.3
Medium Trucks:	66.0	64.5	53.3	57.8	65.7	65.8
Heavy Trucks:	72.2	69.8	68.0	65.7	72.9	73.3
Vehicle Noise:	74.3	72.1	68.9	67.4	74.7	75.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	103	222	478	1,030
CNEL:	108	232	500	1,078

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 2
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,684	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,268	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.02%
Medium Trucks:	84.8%	1.6%	13.5%	4.79%
Heavy Trucks:	68.7%	11.4%	19.9%	7.19%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.82	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.46	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.70	0.82	-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:	68.0	66.1	60.9	60.7	68.2	68.4
Medium Trucks:	66.2	64.7	53.5	57.9	65.8	65.9
Heavy Trucks:	72.3	69.9	68.1	65.7	73.0	73.3
Vehicle Noise:	74.4	72.2	69.0	67.5	74.8	75.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	104	225	485	1,044
CNEL:	109	236	507	1,093

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 3

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,684	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,268	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.02%
Medium Trucks:	84.8%	1.6%	13.5%	4.79%
Heavy Trucks:	68.7%	11.4%	19.9%	7.19%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.82	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.46	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.70	0.82	-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:	68.0	66.1	60.9	60.7	68.2	68.4
Medium Trucks:	66.2	64.7	53.5	57.9	65.8	65.9
Heavy Trucks:	72.3	69.9	68.1	65.7	73.0	73.3
Vehicle Noise:	74.4	72.2	69.0	67.5	74.8	75.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	104	225	485	1,044
CNEL:	109	236	507	1,093

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 4

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,624	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,262	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.44%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.86%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.82	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.56	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.92	0.82	-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:	68.0	66.1	60.9	60.7	68.2	68.4
Medium Trucks:	66.1	64.6	53.4	57.8	65.7	65.8
Heavy Trucks:	72.1	69.7	67.9	65.5	72.7	73.1
Vehicle Noise:	74.2	72.1	68.8	67.3	74.6	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	220	473	1,019
CNEL:	107	230	495	1,067

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 5

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,624	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,262	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.44%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.86%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.82	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.56	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.92	0.82	-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:	68.0	66.1	60.9	60.7	68.2	68.4
Medium Trucks:	66.1	64.6	53.4	57.8	65.7	65.8
Heavy Trucks:	72.1	69.7	67.9	65.5	72.7	73.1
Vehicle Noise:	74.2	72.1	68.8	67.3	74.6	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	220	473	1,019
CNEL:	107	230	495	1,067

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2017
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,592	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,159	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.43%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.19	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.93	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.29	0.82	-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:	67.6	65.7	60.6	60.4	67.8	68.0
Medium Trucks:	65.7	64.2	53.0	57.5	65.3	65.4
Heavy Trucks:	71.7	69.3	67.5	65.2	72.4	72.7
Vehicle Noise:	73.9	71.7	68.4	66.9	74.3	74.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	96	208	447	963
CNEL:	101	217	468	1,008

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Waterman Av.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,442	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,444	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.23	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.99	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.40	0.82	-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	66.6	61.5	61.3	68.8	69.0
Medium Trucks:	66.6	65.1	53.9	58.4	66.3	66.4
Heavy Trucks:	72.6	70.2	68.4	66.0	73.3	73.6
Vehicle Noise:	74.8	72.6	69.3	67.8	75.2	75.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	111	239	514	1,108
CNEL:	116	250	538	1,159

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Waterman Av.
Road Segment: s/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,873	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,587	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.82	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.58	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-11.99	0.82	-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:	69.0	67.1	61.9	61.7	69.2	69.4
Medium Trucks:	67.0	65.5	54.3	58.8	66.7	66.8
Heavy Trucks:	73.0	70.6	68.8	66.5	73.7	74.0
Vehicle Noise:	75.2	73.0	69.7	68.2	75.6	75.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	118	254	548	1,180
CNEL:	123	266	573	1,234

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,566	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	257	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-7.76	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-20.53	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.94	0.82	-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:	58.3	56.4	51.3	51.1	58.6	58.8
Medium Trucks:	56.8	55.3	44.1	48.6	56.5	56.5
Heavy Trucks:	63.7	61.3	59.5	57.1	64.3	64.7
Vehicle Noise:	65.4	63.2	60.2	58.6	65.9	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	57	123	266
CNEL:	28	60	129	279

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: w/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,180	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,718	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.50	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-12.27	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-10.68	0.82	-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:	66.6	64.7	59.6	59.4	66.8	67.0
Medium Trucks:	65.1	63.6	52.4	56.8	64.7	64.8
Heavy Trucks:	71.9	69.5	67.7	65.4	72.6	73.0
Vehicle Noise:	73.7	71.5	68.5	66.8	74.1	74.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	94	203	438	944
CNEL:	99	213	459	989

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,773	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,777	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.58	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-10.18	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-8.59	0.82	-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	61.7	61.4	68.9	69.1
Medium Trucks:	67.2	65.6	54.5	58.9	66.8	66.9
Heavy Trucks:	74.0	71.6	69.8	67.5	74.7	75.0
Vehicle Noise:	75.8	73.6	70.5	68.9	76.2	76.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	130	280	604	1,300
CNEL:	136	294	633	1,363

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o E St.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,630	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,163	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.50	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-11.27	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-9.68	0.82	-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:	67.6	65.7	60.6	60.4	67.8	68.0
Medium Trucks:	66.1	64.6	53.4	57.8	65.7	65.8
Heavy Trucks:	72.9	70.5	68.7	66.4	73.6	74.0
Vehicle Noise:	74.7	72.5	69.5	67.8	75.1	75.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	110	237	511	1,101
CNEL:	115	249	535	1,154

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: w/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,629	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,663	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.61	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.38	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-11.79	0.82	-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	62.1	61.9	69.4	69.6
Medium Trucks:	67.2	65.7	54.5	59.0	66.9	67.0
Heavy Trucks:	73.2	70.8	69.0	66.7	73.9	74.2
Vehicle Noise:	75.4	73.2	69.9	68.4	75.8	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	122	262	565	1,217
CNEL:	127	274	591	1,273

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,108	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,511	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.03	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.79	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.21	0.82	-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	66.8	61.7	61.5	69.0	69.2
Medium Trucks:	66.8	65.3	54.1	58.6	66.5	66.6
Heavy Trucks:	72.8	70.4	68.6	66.2	73.4	73.8
Vehicle Noise:	75.0	72.8	69.5	68.0	75.4	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	114	246	530	1,141
CNEL:	119	257	554	1,194

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 2
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,359	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,436	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.25	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.02	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.43	0.82	-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	61.5	61.3	68.8	69.0
Medium Trucks:	66.6	65.1	53.9	58.4	66.3	66.3
Heavy Trucks:	72.6	70.1	68.4	66.0	73.2	73.6
Vehicle Noise:	74.7	72.6	69.3	67.8	75.2	75.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	110	238	512	1,103
CNEL:	115	249	536	1,155

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 3
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,359	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,436	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.25	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.02	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.43	0.82	-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	61.5	61.3	68.8	69.0
Medium Trucks:	66.6	65.1	53.9	58.4	66.3	66.3
Heavy Trucks:	72.6	70.1	68.4	66.0	73.2	73.6
Vehicle Noise:	74.7	72.6	69.3	67.8	75.2	75.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	110	238	512	1,103
CNEL:	115	249	536	1,155

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 4
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,959	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,396	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.37	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.14	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.55	0.82	-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	61.4	61.2	68.6	68.9
Medium Trucks:	66.5	65.0	53.8	58.3	66.1	66.2
Heavy Trucks:	72.4	70.0	68.2	65.9	73.1	73.5
Vehicle Noise:	74.6	72.5	69.2	67.7	75.0	75.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	108	233	503	1,083
CNEL:	113	244	526	1,133

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 5
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,327	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,233	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.91	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.68	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.09	0.82	-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:	67.9	66.0	60.8	60.6	68.1	68.3
Medium Trucks:	65.9	64.4	53.2	57.7	65.6	65.7
Heavy Trucks:	71.9	69.5	67.7	65.4	72.6	72.9
Vehicle Noise:	74.1	71.9	68.6	67.1	74.5	74.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	100	215	463	997
CNEL:	104	225	484	1,043

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA + Cumulative 2017 Without Pr
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,292	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,129	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.30	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-15.06	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.47	0.82	-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:	67.5	65.6	60.5	60.3	67.7	67.9
Medium Trucks:	65.6	64.1	52.9	57.3	65.2	65.3
Heavy Trucks:	71.5	69.1	67.3	65.0	72.2	72.6
Vehicle Noise:	73.7	71.6	68.3	66.8	74.1	74.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	94	203	436	940
CNEL:	98	212	457	984

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Waterman Av.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,477	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,448	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.58%
Medium Trucks:	84.8%	1.6%	13.5%	4.67%
Heavy Trucks:	68.7%	11.4%	19.9%	6.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.21	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.99	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.40	0.82	-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	61.5	61.3	68.8	69.0
Medium Trucks:	66.6	65.1	53.9	58.4	66.3	66.4
Heavy Trucks:	72.6	70.2	68.4	66.0	73.3	73.6
Vehicle Noise:	74.8	72.6	69.3	67.8	75.2	75.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	111	239	514	1,108
CNEL:	116	250	538	1,160

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Waterman Av.
Road Segment: s/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,953	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,595	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.30%
Medium Trucks:	84.8%	1.6%	13.5%	4.73%
Heavy Trucks:	68.7%	11.4%	19.9%	6.97%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.81	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.52	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-11.84	0.82	-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:	69.0	67.1	62.0	61.7	69.2	69.4
Medium Trucks:	67.1	65.6	54.4	58.9	66.8	66.8
Heavy Trucks:	73.2	70.7	69.0	66.6	73.8	74.2
Vehicle Noise:	75.3	73.1	69.9	68.4	75.7	76.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	120	259	557	1,200
CNEL:	126	271	583	1,256

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,593	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	259	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.68%
Medium Trucks:	84.8%	1.6%	13.5%	4.64%
Heavy Trucks:	68.7%	11.4%	19.9%	6.69%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-7.71	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-20.53	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.94	0.82	-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:	58.4	56.5	51.4	51.1	58.6	58.8
Medium Trucks:	56.8	55.3	44.1	48.6	56.5	56.5
Heavy Trucks:	63.7	61.3	59.5	57.1	64.3	64.7
Vehicle Noise:	65.4	63.3	60.2	58.6	65.9	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	57	124	266
CNEL:	28	60	129	279

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Orange Show Rd.
Road Segment: w/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,232	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,723	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.42%
Medium Trucks:	84.8%	1.6%	13.5%	4.71%
Heavy Trucks:	68.7%	11.4%	19.9%	6.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.50	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-12.23	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-10.59	0.82	-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:	66.6	64.7	59.6	59.4	66.8	67.0
Medium Trucks:	65.1	63.6	52.4	56.9	64.8	64.8
Heavy Trucks:	72.0	69.6	67.8	65.5	72.7	73.0
Vehicle Noise:	73.8	71.6	68.5	66.9	74.2	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	95	205	443	954
CNEL:	100	215	464	1,000

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Orange Show Rd.
Road Segment: e/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,868	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,787	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.42%
Medium Trucks:	84.8%	1.6%	13.5%	4.71%
Heavy Trucks:	68.7%	11.4%	19.9%	6.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.59	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-10.14	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-8.50	0.82	-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	61.7	61.4	68.9	69.1
Medium Trucks:	67.2	65.7	54.5	59.0	66.9	66.9
Heavy Trucks:	74.1	71.7	69.9	67.6	74.8	75.1
Vehicle Noise:	75.8	73.7	70.6	69.0	76.3	76.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	131	283	610	1,314
CNEL:	138	297	639	1,377

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Orange Show Rd.
Road Segment: e/o E St.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,730	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,173	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.38%
Medium Trucks:	84.8%	1.6%	13.5%	4.72%
Heavy Trucks:	68.7%	11.4%	19.9%	6.91%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.51	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-11.22	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-9.56	0.82	-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:	67.6	65.7	60.6	60.4	67.8	68.0
Medium Trucks:	66.1	64.6	53.4	57.9	65.8	65.8
Heavy Trucks:	73.0	70.6	68.9	66.5	73.7	74.1
Vehicle Noise:	74.8	72.6	69.6	67.9	75.2	75.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	112	240	518	1,116
CNEL:	117	252	543	1,169

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Orange Show Rd.
Road Segment: w/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,731	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,673	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.33%
Medium Trucks:	84.8%	1.6%	13.5%	4.72%
Heavy Trucks:	68.7%	11.4%	19.9%	6.95%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.60	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.32	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-11.64	0.82	-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	62.2	61.9	69.4	69.6
Medium Trucks:	67.3	65.8	54.6	59.1	67.0	67.0
Heavy Trucks:	73.4	70.9	69.2	66.8	74.0	74.4
Vehicle Noise:	75.5	73.3	70.1	68.6	75.9	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	124	267	574	1,237
CNEL:	129	279	601	1,295

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Orange Show Rd.
Road Segment: e/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,278 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,528 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.03%
Medium Trucks:	84.8%	1.6%	13.5%	4.78%
Heavy Trucks:	68.7%	11.4%	19.9%	7.19%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.01	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.66	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-11.89	0.82	-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	61.8	61.5	69.0	69.2
Medium Trucks:	67.0	65.5	54.3	58.7	66.6	66.7
Heavy Trucks:	73.1	70.7	68.9	66.6	73.8	74.1
Vehicle Noise:	75.2	73.0	69.8	68.3	75.6	75.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	118	255	549	1,182
CNEL:	124	267	574	1,238

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 2
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,466 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,447 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.09%
Medium Trucks:	84.8%	1.6%	13.5%	4.78%
Heavy Trucks:	68.7%	11.4%	19.9%	7.14%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.24	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.90	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.16	0.82	-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	66.6	61.5	61.3	68.8	69.0
Medium Trucks:	66.7	65.2	54.0	58.5	66.4	66.4
Heavy Trucks:	72.8	70.4	68.6	66.3	73.5	73.9
Vehicle Noise:	74.9	72.8	69.5	68.0	75.3	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	114	245	527	1,136
CNEL:	119	256	552	1,189

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 3
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,466 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,447 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.09%
Medium Trucks:	84.8%	1.6%	13.5%	4.78%
Heavy Trucks:	68.7%	11.4%	19.9%	7.14%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.24	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.90	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.16	0.82	-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	66.6	61.5	61.3	68.8	69.0
Medium Trucks:	66.7	65.2	54.0	58.5	66.4	66.4
Heavy Trucks:	72.8	70.4	68.6	66.3	73.5	73.9
Vehicle Noise:	74.9	72.8	69.5	68.0	75.3	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	114	245	527	1,136
CNEL:	119	256	552	1,189

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 4
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,006 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,401 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.45%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.85%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.36	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.11	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.48	0.82	-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	61.4	61.2	68.7	68.9
Medium Trucks:	66.5	65.0	53.8	58.3	66.2	66.2
Heavy Trucks:	72.5	70.1	68.3	66.0	73.2	73.5
Vehicle Noise:	74.7	72.5	69.3	67.7	75.1	75.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	109	235	507	1,092
CNEL:	114	246	530	1,142

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 5
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,374	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,237	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.44%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.86%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.90	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.65	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.01	0.82	-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:	67.9	66.0	60.9	60.6	68.1	68.3
Medium Trucks:	66.0	64.5	53.3	57.7	65.6	65.7
Heavy Trucks:	72.0	69.6	67.8	65.4	72.6	73.0
Vehicle Noise:	74.1	72.0	68.7	67.2	74.6	74.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	101	217	467	1,006
CNEL:	105	227	489	1,053

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC 2017
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,342	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,134	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.43%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.28	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-15.03	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.38	0.82	-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:	67.5	65.6	60.5	60.3	67.7	68.0
Medium Trucks:	65.6	64.1	52.9	57.4	65.3	65.3
Heavy Trucks:	71.6	69.2	67.4	65.1	72.3	72.6
Vehicle Noise:	73.8	71.6	68.3	66.8	74.2	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	95	205	441	950
CNEL:	99	214	461	994

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Waterman Av.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,386	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,939	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.86	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-10.91	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-9.32	0.82	-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	69.7	64.6	64.4	71.9	72.1
Medium Trucks:	69.7	68.2	57.0	61.5	69.4	69.4
Heavy Trucks:	75.7	73.3	71.5	69.1	76.3	76.7
Vehicle Noise:	77.9	75.7	72.4	70.9	78.3	78.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	178	383	826	1,779
CNEL:	186	401	864	1,861

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Waterman Av.
Road Segment: s/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,493	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,149	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	2.16	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-10.60	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-9.02	0.82	-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:	72.0	70.0	64.9	64.7	72.2	72.4
Medium Trucks:	70.0	68.5	57.3	61.8	69.7	69.7
Heavy Trucks:	76.0	73.6	71.8	69.4	76.6	77.0
Vehicle Noise:	78.2	76.0	72.7	71.2	78.6	78.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	186	401	865	1,863
CNEL:	195	420	905	1,949

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,034 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	303 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-7.03	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.80	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.21	0.82	-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:	59.1	57.1	52.0	51.8	59.3	59.5
Medium Trucks:	57.5	56.0	44.8	49.3	57.2	57.3
Heavy Trucks:	64.4	62.0	60.2	57.9	65.1	65.4
Vehicle Noise:	66.2	64.0	60.9	59.3	66.6	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	64	138	297
CNEL:	31	67	145	311

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Orange Show Rd.
Road Segment: w/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,857 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,486 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.10	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-10.66	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-9.07	0.82	-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	61.2	61.0	68.4	68.6
Medium Trucks:	66.7	65.2	54.0	58.4	66.3	66.4
Heavy Trucks:	73.5	71.1	69.3	67.0	74.2	74.6
Vehicle Noise:	75.3	73.1	70.1	68.4	75.7	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	121	260	561	1,208
CNEL:	127	273	588	1,266

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Orange Show Rd.
Road Segment: e/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	38,655 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,866 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	4.02	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-8.75	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-7.16	0.82	-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	63.1	62.9	70.3	70.6
Medium Trucks:	68.6	67.1	55.9	60.4	68.3	68.3
Heavy Trucks:	75.5	73.0	71.3	68.9	76.1	76.5
Vehicle Noise:	77.2	75.0	72.0	70.3	77.7	78.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	162	349	752	1,621
CNEL:	170	366	789	1,699

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Orange Show Rd.
Road Segment: e/o E St.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,702 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,970 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.87	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-9.89	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-8.30	0.82	-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:	69.0	67.1	61.9	61.7	69.2	69.4
Medium Trucks:	67.4	65.9	54.8	59.2	67.1	67.2
Heavy Trucks:	74.3	71.9	70.1	67.8	75.0	75.3
Vehicle Noise:	76.1	73.9	70.8	69.2	76.5	76.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	136	293	631	1,360
CNEL:	143	307	662	1,425

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Orange Show Rd.
Road Segment: w/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,592	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,159	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.52	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-12.24	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-10.65	0.82	-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:	70.3	68.4	63.3	63.1	70.5	70.8
Medium Trucks:	68.4	66.9	55.7	60.2	68.0	68.1
Heavy Trucks:	74.3	71.9	70.1	67.8	75.0	75.4
Vehicle Noise:	76.5	74.4	71.1	69.6	76.9	77.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	145	312	672	1,448
CNEL:	152	327	703	1,515

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,223	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,022	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.24	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-12.53	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-10.94	0.82	-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	63.0	62.8	70.3	70.5
Medium Trucks:	68.1	66.6	55.4	59.9	67.8	67.8
Heavy Trucks:	74.1	71.6	69.9	67.5	74.7	75.1
Vehicle Noise:	76.2	74.1	70.8	69.3	76.6	76.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	139	299	644	1,386
CNEL:	145	313	673	1,451

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 2
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,946	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,595	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.80	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.56	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-11.97	0.82	-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:	69.0	67.1	62.0	61.8	69.2	69.4
Medium Trucks:	67.1	65.6	54.4	58.8	66.7	66.8
Heavy Trucks:	73.0	70.6	68.8	66.5	73.7	74.1
Vehicle Noise:	75.2	73.0	69.8	68.3	75.6	75.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	118	255	549	1,183
CNEL:	124	267	575	1,238

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 3
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,946	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,595	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.80	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.56	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-11.97	0.82	-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:	69.0	67.1	62.0	61.8	69.2	69.4
Medium Trucks:	67.1	65.6	54.4	58.8	66.7	66.8
Heavy Trucks:	73.0	70.6	68.8	66.5	73.7	74.1
Vehicle Noise:	75.2	73.0	69.8	68.3	75.6	75.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	118	255	549	1,183
CNEL:	124	267	575	1,238

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 4

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,741	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,574	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.85	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.62	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.03	0.82	-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	61.9	61.7	69.2	69.4
Medium Trucks:	67.0	65.5	54.3	58.8	66.7	66.7
Heavy Trucks:	73.0	70.5	68.8	66.4	73.6	74.0
Vehicle Noise:	75.1	73.0	69.7	68.2	75.6	75.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	117	253	545	1,173
CNEL:	123	264	570	1,228

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 5

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,332	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,533	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.97	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.73	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.14	0.82	-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	61.8	61.6	69.1	69.3
Medium Trucks:	66.9	65.4	54.2	58.7	66.6	66.6
Heavy Trucks:	72.9	70.4	68.7	66.3	73.5	73.9
Vehicle Noise:	75.0	72.9	69.6	68.1	75.4	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	115	248	535	1,153
CNEL:	121	260	560	1,206

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 Without Project
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.

Project Name: Orange Show Logistics Ce
Job Number: 9926

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:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.56%
Medium Trucks:	84.8%	1.6%	13.5%	4.69%
Heavy Trucks:	68.7%	11.4%	19.9%	6.76%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.33	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.09	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.51	0.82	-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	66.5	61.4	61.2	68.7	68.9
Medium Trucks:	66.5	65.0	53.8	58.3	66.2	66.3
Heavy Trucks:	72.5	70.1	68.3	65.9	73.1	73.5
Vehicle Noise:	74.7	72.5	69.2	67.7	75.1	75.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	109	235	506	1,090
CNEL:	114	246	529	1,141

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Waterman Av.
Road Segment: n/o Orange Show Rd.

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,421	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,942	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.57%
Medium Trucks:	84.8%	1.6%	13.5%	4.68%
Heavy Trucks:	68.7%	11.4%	19.9%	6.75%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.86	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-10.91	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-9.32	0.82	-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	69.7	64.6	64.4	71.9	72.1
Medium Trucks:	69.7	68.2	57.0	61.5	69.4	69.4
Heavy Trucks:	75.7	73.3	71.5	69.1	76.3	76.7
Vehicle Noise:	77.9	75.7	72.4	70.9	78.3	78.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	178	383	826	1,779
CNEL:	186	401	864	1,862

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Waterman Av.
Road Segment: s/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,573 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,157 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.43%
Medium Trucks:	84.8%	1.6%	13.5%	4.71%
Heavy Trucks:	68.7%	11.4%	19.9%	6.86%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	2.16	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-10.57	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-8.94	0.82	-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:	72.0	70.0	64.9	64.7	72.2	72.4
Medium Trucks:	70.0	68.5	57.4	61.8	69.7	69.8
Heavy Trucks:	76.1	73.6	71.9	69.5	76.7	77.1
Vehicle Noise:	78.2	76.1	72.8	71.3	78.6	78.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	188	405	872	1,879
CNEL:	197	424	913	1,966

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,061 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	306 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.66%
Medium Trucks:	84.8%	1.6%	13.5%	4.64%
Heavy Trucks:	68.7%	11.4%	19.9%	6.70%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-6.99	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.80	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.21	0.82	-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:	59.1	57.2	52.1	51.9	59.3	59.6
Medium Trucks:	57.5	56.0	44.8	49.3	57.2	57.3
Heavy Trucks:	64.4	62.0	60.2	57.9	65.1	65.4
Vehicle Noise:	66.2	64.0	60.9	59.3	66.6	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	64	138	298
CNEL:	31	67	145	312

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Orange Show Rd.
Road Segment: w/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,909 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,491 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.46%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.84%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.11	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-10.64	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-9.01	0.82	-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	61.2	61.0	68.4	68.6
Medium Trucks:	66.7	65.2	54.0	58.5	66.4	66.4
Heavy Trucks:	73.6	71.2	69.4	67.0	74.3	74.6
Vehicle Noise:	75.3	73.2	70.1	68.5	75.8	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	122	262	564	1,216
CNEL:	127	275	592	1,275

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Orange Show Rd.
Road Segment: e/o I-215 NB Ramps
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	38,750 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,875 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.46%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.84%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	4.02	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-8.72	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-7.09	0.82	-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	63.1	62.9	70.4	70.6
Medium Trucks:	68.6	67.1	55.9	60.4	68.3	68.3
Heavy Trucks:	75.5	73.1	71.3	69.0	76.2	76.5
Vehicle Noise:	77.3	75.1	72.0	70.4	77.7	78.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	163	352	758	1,633
CNEL:	171	369	795	1,712

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Orange Show Rd.
Road Segment: e/o E St.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,802	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,980	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.43%
Medium Trucks:	84.8%	1.6%	13.5%	4.71%
Heavy Trucks:	68.7%	11.4%	19.9%	6.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.88	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-9.86	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-8.22	0.82	-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:	69.0	67.1	62.0	61.7	69.2	69.4
Medium Trucks:	67.5	66.0	54.8	59.3	67.1	67.2
Heavy Trucks:	74.4	72.0	70.2	67.8	75.1	75.4
Vehicle Noise:	76.1	73.9	70.9	69.3	76.6	76.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	137	296	637	1,373
CNEL:	144	310	668	1,440

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Orange Show Rd.
Road Segment: w/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,694	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,169	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.38%
Medium Trucks:	84.8%	1.6%	13.5%	4.71%
Heavy Trucks:	68.7%	11.4%	19.9%	6.91%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.53	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-12.20	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-10.54	0.82	-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:	70.3	68.4	63.3	63.1	70.6	70.8
Medium Trucks:	68.4	66.9	55.7	60.2	68.1	68.2
Heavy Trucks:	74.5	72.0	70.3	67.9	75.1	75.5
Vehicle Noise:	76.6	74.4	71.2	69.7	77.0	77.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	147	316	681	1,467
CNEL:	154	331	712	1,535

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Orange Show Rd.
Road Segment: e/o Waterman Av.
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,393	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,039	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.16%
Medium Trucks:	84.8%	1.6%	13.5%	4.76%
Heavy Trucks:	68.7%	11.4%	19.9%	7.08%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.25	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-12.43	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-10.70	0.82	-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	63.0	62.8	70.3	70.5
Medium Trucks:	68.2	66.7	55.5	60.0	67.9	67.9
Heavy Trucks:	74.3	71.9	70.1	67.7	75.0	75.3
Vehicle Noise:	76.4	74.2	71.0	69.5	76.8	77.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	142	307	661	1,424
CNEL:	149	321	692	1,490

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 2
Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,053	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,605	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.13%
Medium Trucks:	84.8%	1.6%	13.5%	4.77%
Heavy Trucks:	68.7%	11.4%	19.9%	7.10%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.79	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.46	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-11.73	0.82	-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:	69.0	67.1	62.0	61.8	69.2	69.4
Medium Trucks:	67.2	65.7	54.5	58.9	66.8	66.9
Heavy Trucks:	73.3	70.8	69.1	66.7	73.9	74.3
Vehicle Noise:	75.4	73.2	70.0	68.4	75.8	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	122	262	564	1,215
CNEL:	127	274	590	1,272

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 3

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,053	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,605	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.13%
Medium Trucks:	84.8%	1.6%	13.5%	4.77%
Heavy Trucks:	68.7%	11.4%	19.9%	7.10%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.79	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.46	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-11.73	0.82	-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:	69.0	67.1	62.0	61.8	69.2	69.4
Medium Trucks:	67.2	65.7	54.5	58.9	66.8	66.9
Heavy Trucks:	73.3	70.8	69.1	66.7	73.9	74.3
Vehicle Noise:	75.4	73.2	70.0	68.4	75.8	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	122	262	564	1,215
CNEL:	127	274	590	1,272

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 4

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,788	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,579	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.46%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.84%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.84	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.59	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-11.96	0.82	-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:	69.0	67.0	61.9	61.7	69.2	69.4
Medium Trucks:	67.0	65.5	54.3	58.8	66.7	66.8
Heavy Trucks:	73.0	70.6	68.8	66.5	73.7	74.1
Vehicle Noise:	75.2	73.0	69.8	68.3	75.6	75.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	118	255	548	1,182
CNEL:	124	266	574	1,236

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Orange Show Rd.
Road Segment: e/o Driveway 5

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,379	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,538	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.46%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.84%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.96	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-13.71	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.07	0.82	-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	61.8	61.6	69.1	69.3
Medium Trucks:	66.9	65.4	54.2	58.7	66.6	66.6
Heavy Trucks:	72.9	70.5	68.7	66.4	73.6	73.9
Vehicle Noise:	75.1	72.9	69.7	68.1	75.5	75.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	116	250	539	1,161
CNEL:	122	262	564	1,215

Monday, December 21, 2015

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2040 With Project
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.

Project Name: Orange Show Logistics Ce
Job Number: 9926

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,150	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,415	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	50	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	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:	77.1%	5.9%	17.0%	88.46%
Medium Trucks:	84.8%	1.6%	13.5%	4.70%
Heavy Trucks:	68.7%	11.4%	19.9%	6.85%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	43.589
Medium Trucks:	43.386
Heavy Trucks:	43.405

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.32	0.79	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-14.07	0.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.43	0.82	-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	61.4	61.2	68.7	68.9
Medium Trucks:	66.6	65.0	53.9	58.3	66.2	66.3
Heavy Trucks:	72.6	70.1	68.4	66.0	73.2	73.6
Vehicle Noise:	74.7	72.6	69.3	67.8	75.1	75.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	110	237	510	1,099
CNEL:	115	248	534	1,150

Monday, December 21, 2015

APPENDIX 9.1:

REFERENCE DISTRIBUTION/WAREHOUSE NOISE SOURCE PHOTOS

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Reference Measurement: Motivational Fulfillment
6810 Bickmore Avenue, Chino

Motivational Fulfillment_01

Motivational Fulfillment_02

Motivational Fulfillment_03

Source_1-1

Source_1-2

Source_1-3

Reference Measurement: Motivational Fulfillment
6810 Bickmore Avenue, Chino

Source_1-4

Source_2-1

Source_2-2

Source_2-3

Source_2-4

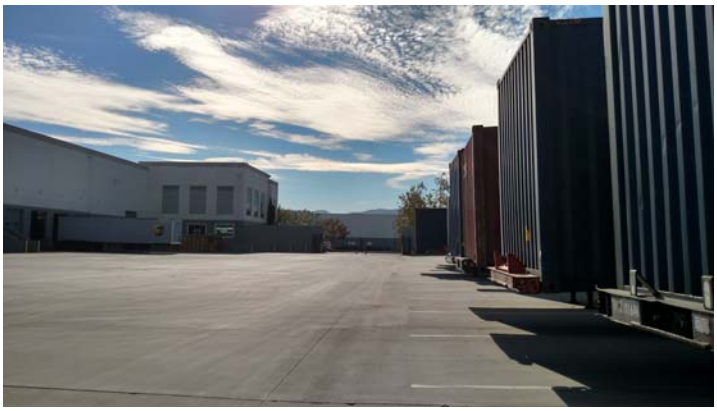
Source_2-5

Reference Measurement: Motivational Fulfillment
6810 Bickmore Avenue, Chino

Source_2-6

Source_2-7

Source_2-8



Source_2-9

Reference **Measurement: Veg Fresh Farms / FedEx**

IMG_0857
33, 51' 31.200000", 117, 54' 48.000000"

IMG_0862
33, 51' 30.600000", 117, 54' 48.600000"

IMG_0863
33, 51' 30.600000", 117, 54' 48.000000"

IMG_0872
33, 51' 33.000000", 117, 54' 42.600000"

APPENDIX 9.2:

OPERATIONAL STATIONARY-SOURCE NOISE CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R1**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	524.0	feet	***Barrier Height:***	**30.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	514.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,017.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,018.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,021.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	524.0	-26.4	-26.4	-26.4	-26.4	-26.4	-26.4
Shielding (Barrier Attenuation)	10.0	-18.0	-18.0	-18.0	-18.0	-18.0	-18.0
Raw (Distance + Barrier)		24.7	22.3	25.5	28.9	31.5	35.8
60 Minute Hourly Adjustment		**24.7**	**22.3**	**25.5**	**28.9**	**31.5**	**35.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R2**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	444.0	feet	***Barrier Height:***	**30.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	434.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,018.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,018.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,021.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	444.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
Shielding (Barrier Attenuation)	10.0	-18.0	-18.0	-18.0	-18.0	-18.0	-18.0
Raw (Distance + Barrier)		26.1	23.7	26.9	30.3	32.9	37.2
60 Minute Hourly Adjustment		**26.1**	**23.7**	**26.9**	**30.3**	**32.9**	**37.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R3**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	410.0	feet	***Barrier Height:***	**30.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	400.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,021.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,017.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,021.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	410.0	-24.3	-24.3	-24.3	-24.3	-24.3	-24.3
Shielding (Barrier Attenuation)	10.0	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1
Raw (Distance + Barrier)		26.7	24.3	27.5	30.9	33.5	37.8
60 Minute Hourly Adjustment		**26.7**	**24.3**	**27.5**	**30.9**	**33.5**	**37.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R4**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	625.0	feet	***Barrier Height:***	**30.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	615.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,028.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,018.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,021.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	625.0	-28.0	-28.0	-28.0	-28.0	-28.0	-28.0
Shielding (Barrier Attenuation)	10.0	-17.9	-17.9	-17.9	-17.9	-17.9	-17.9
Raw (Distance + Barrier)		23.2	20.8	24.0	27.4	30.0	34.3
60 Minute Hourly Adjustment		**23.2**	**20.8**	**24.0**	**27.4**	**30.0**	**34.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R5**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	221.0	feet	***Barrier Height:***	**12.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	211.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,024.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,019.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,019.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	221.0	-18.9	-18.9	-18.9	-18.9	-18.9	-18.9
Shielding (Barrier Attenuation)	10.0	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5
Raw (Distance + Barrier)		40.7	38.3	41.5	44.9	47.5	51.8
60 Minute Hourly Adjustment		**40.7**	**38.3**	**41.5**	**44.9**	**47.5**	**51.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R6**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	449.0	feet	***Barrier Height:***	**12.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	439.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,025.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,019.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,019.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	449.0	-25.1	-25.1	-25.1	-25.1	-25.1	-25.1
Shielding (Barrier Attenuation)	10.0	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5
Raw (Distance + Barrier)		34.5	32.1	35.3	38.7	41.3	45.6
60 Minute Hourly Adjustment		**34.5**	**32.1**	**35.3**	**38.7**	**41.3**	**45.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R7**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,213.0	feet	***Barrier Height:***	**12.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	1,203.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,034.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,019.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,019.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	1,213.0	-33.7	-33.7	-33.7	-33.7	-33.7	-33.7
Shielding (Barrier Attenuation)	10.0	-9.4	-9.4	-9.4	-9.4	-9.4	-9.4
Raw (Distance + Barrier)		26.0	23.6	26.8	30.2	32.8	37.1
60 Minute Hourly Adjustment		**26.0**	**23.6**	**26.8**	**30.2**	**32.8**	**37.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R8**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,173.0	feet	***Barrier Height:***	**12.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	1,163.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,018.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,019.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,019.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	1,173.0	-33.4	-33.4	-33.4	-33.4	-33.4	-33.4
Shielding (Barrier Attenuation)	10.0	-9.6	-9.6	-9.6	-9.6	-9.6	-9.6
Raw (Distance + Barrier)		26.1	23.7	26.9	30.3	32.9	37.2
60 Minute Hourly Adjustment		**26.1**	**23.7**	**26.9**	**30.3**	**32.9**	**37.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R9**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,509.0	feet	***Barrier Height:***	**12.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	1,499.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,012.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,019.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,019.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	1,509.0	-35.6	-35.6	-35.6	-35.6	-35.6	-35.6
Shielding (Barrier Attenuation)	10.0	-9.7	-9.7	-9.7	-9.7	-9.7	-9.7
Raw (Distance + Barrier)		23.8	21.4	24.6	28.0	30.6	34.9
60 Minute Hourly Adjustment		**23.8**	**21.4**	**24.6**	**28.0**	**30.6**	**34.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R10**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,363.0	feet	***Barrier Height:***	**12.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	1,353.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,012.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,018.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,018.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	1,363.0	-34.7	-34.7	-34.7	-34.7	-34.7	-34.7
Shielding (Barrier Attenuation)	10.0	-9.7	-9.7	-9.7	-9.7	-9.7	-9.7
Raw (Distance + Barrier)		24.7	22.3	25.5	28.9	31.5	35.8
60 Minute Hourly Adjustment		**24.7**	**22.3**	**25.5**	**28.9**	**31.5**	**35.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R11**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,191.0	feet	***Barrier Height:***	**12.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	1,181.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,014.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,018.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,018.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	1,191.0	-33.6	-33.6	-33.6	-33.6	-33.6	-33.6
Shielding (Barrier Attenuation)	10.0	-9.6	-9.6	-9.6	-9.6	-9.6	-9.6
Raw (Distance + Barrier)		25.9	23.5	26.7	30.1	32.7	37.0
60 Minute Hourly Adjustment		**25.9**	**23.5**	**26.7**	**30.1**	**32.7**	**37.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

12/21/2015

Observer Location: **R12**
Source: Typical Distribution/Warehouse Activities
Condition: Operational

Project Name: Orange Show Logistics Center
Job Number: 9926
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	444.0	feet	***Barrier Height:***	**30.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	434.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	1,017.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	1,018.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	1,021.0	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)	25.0	69.1	66.7	69.9	73.3	75.9	80.2
Distance Attenuation	444.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
Shielding (Barrier Attenuation)	10.0	-18.0	-18.0	-18.0	-18.0	-18.0	-18.0
Raw (Distance + Barrier)		26.1	23.7	26.9	30.3	32.9	37.2
60 Minute Hourly Adjustment		**26.1**	**23.7**	**26.9**	**30.3**	**32.9**	**37.2**

APPENDIX 10.1:

REFERENCE CONSTRUCTION NOISE LEVEL MEASUREMENTS MEMO

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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"

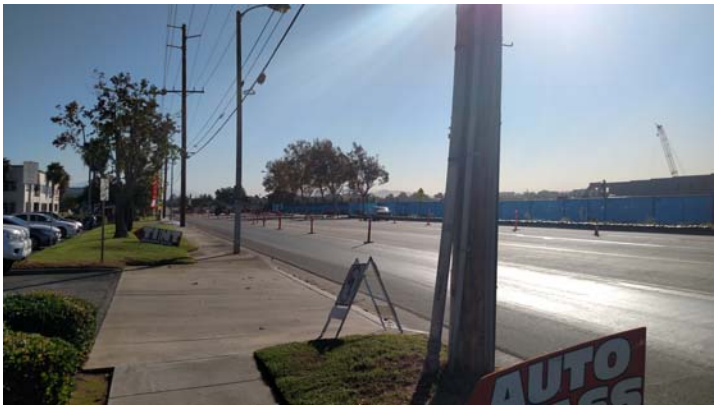
R2_South
34, 4' 39.217500", 117, 36' 29.108200"

R2_Southwest
34, 4' 39.217500", 117, 36' 29.108200"

R2_Southwest2
34, 4' 39.505900", 117, 36' 28.970900"

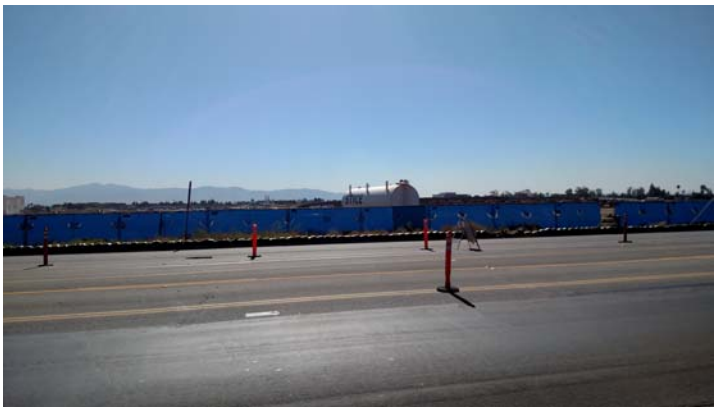
R2_West
34, 4' 39.217500", 117, 36' 29.108200"

R3
34, 4' 39.972800", 117, 36' 16.803500"

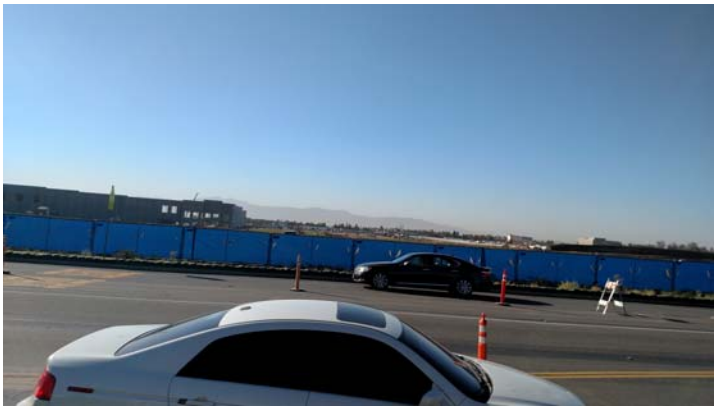


R3_E
34, 4' 39.972800", 117, 36' 16.803500"

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"