Canterwood (Tentative Tract Map No. 37439)

NOISE IMPACT ANALYSIS

COUNTY OF RIVERSIDE

PREPARED BY:

Bill Lawson, PE, INCE
blawson@urbanxroads.com
(949) 336-5979

Alex Wolfe, INCE
awolfe@urbanxroads.com
(949) 336-5977

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
I-215	Interstate 215
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
PPV	Peak Particle Velocity
Project	Canterwood (Tentative Tract Map No. 37439)
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

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EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Canterwood (Tentative Tract Map No. 37439) development ("Project"). The proposed Canterwood (Tentative Tract Map No. 37439) site is located on the northeast corner of Leon Road and Craig Avenue in unincorporated County of Riverside. The Project is proposed to consist of up to 574 single-family residential dwelling units across two phases (Phase 1 and Project Buildout). This noise impact analysis was prepared to satisfy the County of Riverside noise level standards and significance criteria based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA). (1)

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the proposed Project will influence the traffic noise levels in surrounding off-site areas. To quantify the traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on 18 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 *Canterwood (Tentative Tract Map No. 37439) Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) To assess the off-site noise level impacts associated with the proposed Project on neighboring noise-sensitive land use noise contour boundaries were developed for Existing, Existing plus Ambient Growth (EA) 2021, EA 2025, EA plus Cumulative Developments (EAC) 2021, and EAC 2025 conditions.

The results of the off-site traffic noise level analysis indicate that Project-related off-site traffic noise level increases will result in *potentially significant* noise impacts at noise-sensitive land uses adjacent to three of the 18 study area roadway segments, as identified below:

- Leon Road south of Craig Avenue (Segment #6);
    - Existing residential homes (approximately 4) and future residential-designated use.
- Leon Road south of Garbani Road (Segment #7);
    - Existing residential homes (approximately 5) and future residential-designated use.
- Holland Road west of Leon Road (Segment #12).
    - Existing residential homes (approximately 3), and future residential-designated use.

Rubberized asphalt is required as a noise mitigation measure to reduce the *potentially significant* Project-related off-site traffic noise level increases under all with Project scenarios. However, this mitigation would not entirely eliminate the off-site traffic noise level increases associated with Project trips at the adjacent land uses, and will still result in a *significant and unavoidable* impact at one of the impacted roadway segments:

- Leon Road south of Craig Avenue (Segment #6).

Due to the low without Project traffic volumes on these roadway segments, the addition of Project-only traffic volumes results in a *significant and unavoidable* impact with mitigation. Since

many of these roadway segments are not yet built out to their Circulation Element classification specifications, the Project will be one of the earlier developments generating traffic on these roadway segments. All other roadway segments will experience *less than significant* off-site traffic noise level increases with Project traffic and the rubber asphalt mitigation, however, impacts on Segment 6 remain *significant and unavoidable*. The off-site roadway segments within the County of Riverside requiring implementation of a rubberized asphalt hot mix overlay are listed below:

- Leon Road south of Craig Avenue (Segment #6);
- Leon Road south of Garbani Road (Segment #7);
- Holland Road west of Leon Road (Segment #12).

ON-SITE TRAFFIC NOISE ANALYSIS

The future unmitigated exterior traffic noise levels are expected to range from 65.3 to 75.1 dBA CNEL and will exceed the County of Riverside 65 dBA CNEL standard for outdoor living areas (backyards) of residential uses. Therefore, on-site traffic noise level impacts are considered *potentially significant*. To satisfy the County of Riverside 65 dBA CNEL exterior noise level standards for residential land use, the construction of the following noise barriers is required:

- 8-foot high noise barriers for outdoor living areas (backyards) of lots 31 to 50, 136 to 149,151 to 153, and 334 to 340 adjacent to Leon Road and Holland Road;
- 6-foot high noise barriers for outdoor living areas (backyards) of lots 7 to 30, 154, 157 to 162, 287 to 296, 347 to 360, 464 to 472, and 558 to 574 adjacent to Eucalyptus Road and Craig Avenue.

With the recommended noise barriers shown on Exhibit ES-A, the mitigated future exterior noise levels will range from 59.7 to 64.6 dBA CNEL and impacts will be reduced to *less than significant*. This noise analysis shows that the recommended noise barriers will satisfy the County of Riverside 65 dBA CNEL exterior noise level standards for residential land use. The effective noise barrier height recommendations represent the minimum wall and/or berm combination height required to satisfy the County of Riverside exterior noise level standards.

The recommended noise control barriers shall be constructed so that the top of each wall extends to the recommended height above the pad elevation of the lot it is shielding. When the road is elevated above the pad elevation, the barrier shall extend to the recommended height above the highest point between the residential home and the road. The barriers shall provide a weight of at least 4 pounds per square foot of face area with no decorative cutouts or line-of-sight openings between shielded areas and the roadways. The barrier must present a solid face from top to bottom. Unnecessary openings or decorative cutouts shall not be made. All gaps (except for weep holes) should be filled with grout or caulking. The noise barrier shall be constructed using one of the following materials:

- Masonry block;
- Stucco veneer over wood framing (or foam core), or one-inch thick tongue and groove wood of sufficient weight per square foot;

- Glass (1/4-inch-thick), or other transparent material with sufficient weight per square foot capable of providing a minimum transmission loss of 20 dBA;
- Earthen berm;
- Any combination of these construction materials.

INTERIOR NOISE MITIGATION

To satisfy the County of Riverside 45 dBA CNEL residential interior noise level standard, Project residential homes will require a Noise Reduction (NR) of up to 29.5 dBA and a windows-closed condition requiring a means of mechanical ventilation (e.g. air conditioning). With the following noise mitigation measures, the Project will satisfy the interior noise level standards:

- Windows/Sliding Glass Doors: All residential units require windows and sliding glass doors that have well-fitted, well-weather-stripped assemblies, and the following sound transmission class (STC) ratings:
    - Upgraded windows and sliding glass doors with minimum STC ratings of 32 are required for all windows/glass doors facing Leon Road and Holland Road in lots 31 to 50, 136 to 149,151 to 153, and 334 to 340;
    - All other residential lots require windows/glass doors with minimum sound transmission class (STC) ratings of 27.
- Exterior Doors (Non-Glass): All exterior doors shall be well weather-stripped and have well-sealed perimeter gaps to achieve minimum sound transmission class (STC) ratings of 27. (3)
- Exterior Walls: At any penetrations of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar to form an airtight seal.
- Roof: Roof sheathing of wood construction shall be per manufacturer's specification or caulked plywood of at least one-half inch thick. Ceilings shall be per manufacturer's specification or well-sealed gypsum board of at least one-half inch thick. Insulation with at least a rating of R-19 shall be used in the attic space.
- Ventilation: Arrangements for any habitable room shall be such that any exterior door or window can be kept closed when the room is in use and still receive circulated air. A forced air circulation system (e.g. air conditioning) or active ventilation system (e.g. fresh air supply) shall be provided which satisfies the requirements of the Uniform Building Code.

With the interior noise mitigation measures provided in this study, the proposed Project is expected to satisfy the County of Riverside 45 dBA CNEL interior noise level standard for residential development.

CONSTRUCTION NOISE ANALYSIS

Construction-related noise impacts are expected to create temporary and intermittent high-level noise conditions at receivers surrounding the Project site when certain activities occur at the closest point to the nearby receiver locations from both primary on-site and off-site Project construction activities. Using sample reference noise levels to represent the planned construction activities of the Canterwood (Tentative Tract Map No. 37439) site, this analysis

estimates the Project-related construction noise levels at nearby sensitive receiver locations. Since the County of Riverside General Plan and Municipal Code do not identify specific construction noise level thresholds, a threshold is identified based on the National Institute for Occupational Safety and Health (NIOSH) limits for construction noise. The results of the analysis show that the worst-case Project-related short-term construction noise levels are expected to range from 51.1 to 71.0 dBA L_{eq} and will satisfy the 85 dBA L_{eq} threshold identified by NIOSH at all receiver locations. Therefore, temporary noise level impacts related to Project construction noise levels will be *less than significant*.

CONSTRUCTION VIBRATION ANALYSIS

At distances ranging from 50 to 540 feet from both on-site and off-site Project construction activities, Project-related construction vibration levels are expected to range from 0.001 to 0.022 in/sec RMS at the nearby sensitive receiver locations, which will exceed the County of Riverside vibration level threshold of 0.01 in/sec RMS at one off-site receiver location, OR2, if Project construction activities occur within 85 feet of occupied noise-sensitive receiver locations. Therefore, the Project-related vibration impacts will be *potentially significant* at receiver location OR2 during the off-site construction activities. All other receiver locations will experience *less than significant* vibration impacts due to Project construction.

Therefore, the use of large mobile equipment (greater than 80,000 pounds) and loaded trucks within 85 feet of nearby sensitive land uses shall be prohibited unless the vibration levels are shown to be less than the County of Riverside vibration level threshold of 0.01 in/sec RMS. Instead, smaller, rubber-tired mobile equipment (less than 80,000 pounds) or equivalent alternative equipment shall be used within 85 feet of sensitive land uses during Project construction to reduce vibration effects. Exhibit ES-B shows the Project construction vibration mitigation at receiver location OR2. With the recommended mitigation measures in this study, the Project-related vibration impacts at the nearby receiver locations represents a *less than significant* impact during the worst-case construction activities.

Further, the vibration levels due to Project construction do not represent vibration levels capable of causing building damage to nearby residential homes. The FTA identifies construction vibration levels capable of building damage ranging from 0.12 to 0.5 in/sec PPV. (4) The peak Project-construction vibration levels approaching 0.031 in/sec PPV will remain below the FTA vibration levels for building damage at the residential homes near the Project site. Further, the levels at the site of the closest sensitive receivers are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

CONSTRUCTION VIBRATION MITIGATION MEASURES

The following mitigation measure is required to reduce construction vibration levels produced by the construction equipment to the nearby sensitive land uses.

- Large loaded trucks and mobile equipment (greater than or equal to 80,000 pounds) (5) shall not be used within 85 feet of land uses represented by receiver location OR2 if occupied at the time of Project construction, as shown on Exhibit ES-B. Instead, smaller, rubber-tired mobile equipment (less than 80,000 pounds) or equivalent alternative equipment shall be used within this area during Project construction to reduce vibration effects.

CONSTRUCTION NOISE AND VIBRATION BEST PRACTICES

Though construction noise and vibration are temporary, intermittent, will be short in duration, and will not present any long-term impacts, the following best practices would further reduce noise and vibration levels produced by the construction equipment to the nearby sensitive residential land uses.

- Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that noise-generating Project construction activities shall only occur between the hours of 6:00 a.m. to 6:00 p.m. June through September, and 7:00 a.m. to 6:00 p.m. October through May (County of Riverside Municipal Code, Section 9.52.020). The Project construction supervisor shall ensure compliance with the note and the County shall conduct periodic inspection at its discretion.
- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the center).
- The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment (between the hours of 6:00 a.m. to 6:00 p.m. June through September, and 7:00 a.m. to 6:00 p.m. October through May). The contractor shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.

SUMMARY OF SIGNIFICANCE FINDINGS

The results of this Canterwood (Tentative Tract Map No. 37439) Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise impact before and after any needed mitigation measures.

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Significant and Unavoidable*	*n/a*
On-Site Traffic Noise	8	*Potentially Significant*	*Less Than Significant*
Construction Noise	10	*Less Than Significant*	*n/a*
Construction Vibration		*Potentially Significant*	*Less Than Significant*

"n/a" = No mitigation is required since the unmitigated impact will be less than significant.

EXHIBIT ES-A: SUMMARY OF RECOMMENDATIONS

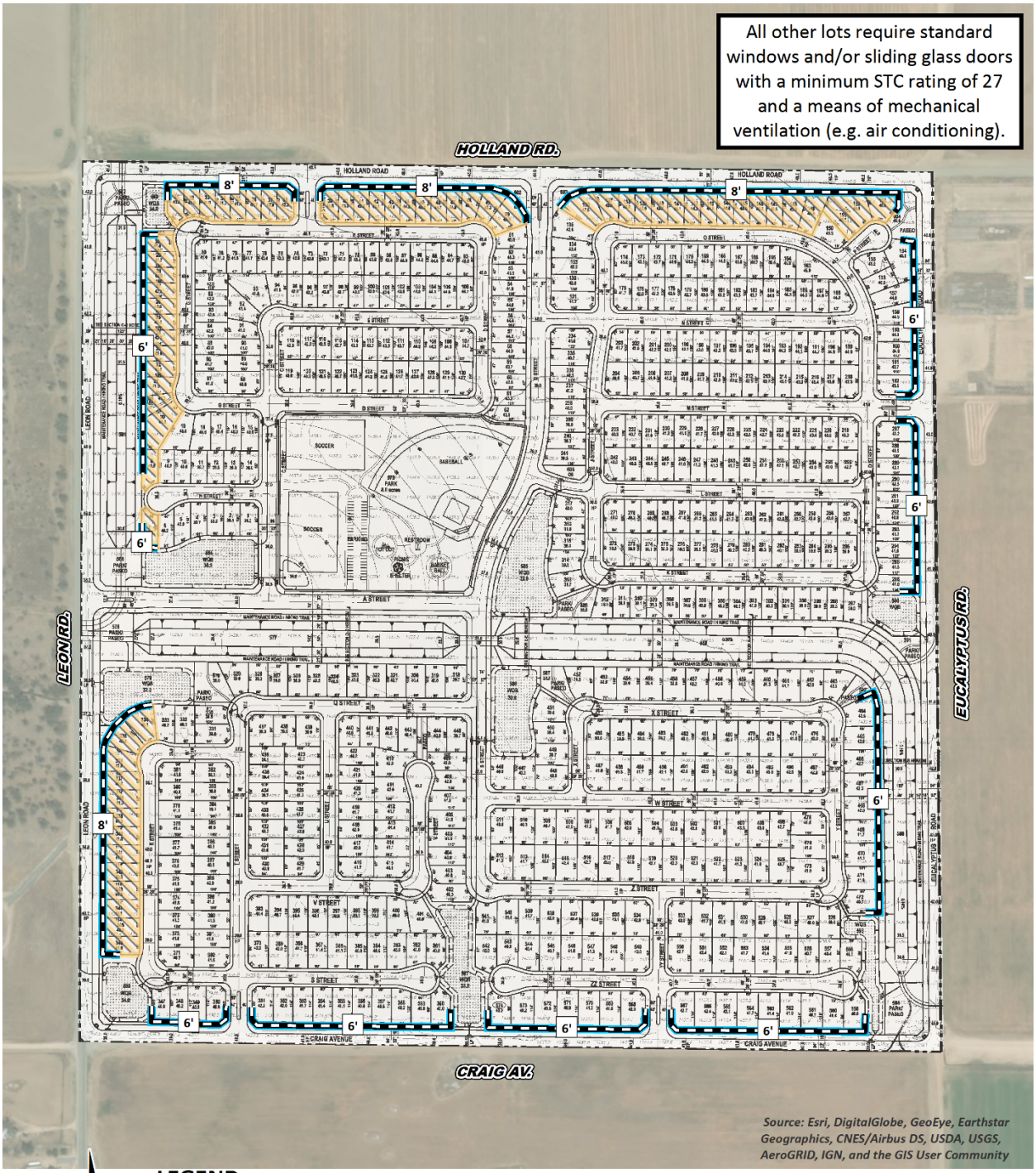
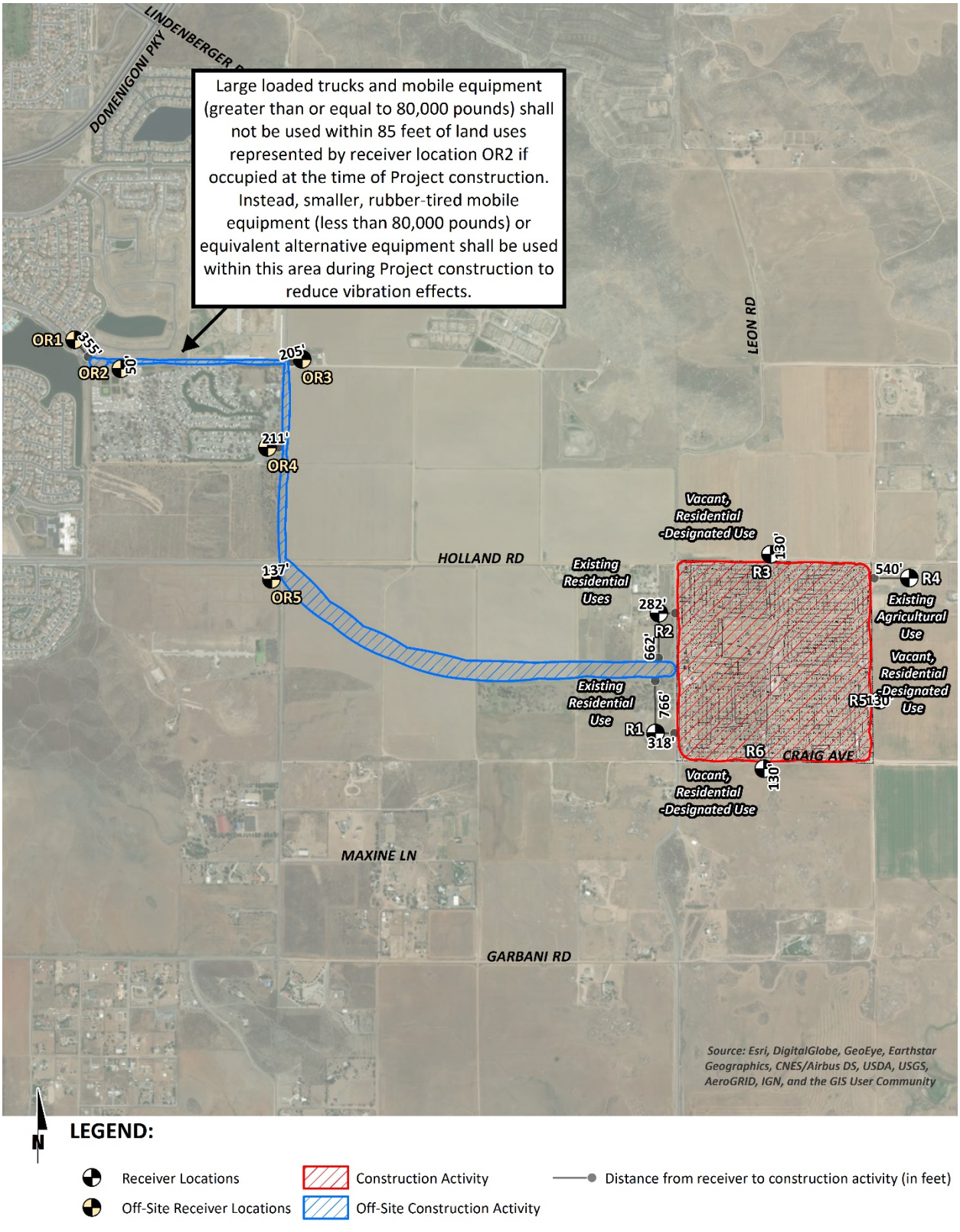


EXHIBIT ES-B: CONSTRUCTION VIBRATION MITIGATION



1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Canterwood (Tentative Tract Map No. 37439) ("Project"). This noise study describes the proposed Project, provides information regarding noise fundamentals, outlines the local regulatory setting, provides the study methods and procedures for traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The proposed Canterwood (Tentative Tract Map No. 37439) site is located on the northeast corner of Leon Road and Craig Avenue in unincorporated County of Riverside, as shown on Exhibit 1-A. The Project site is currently vacant. Existing residential uses are located west across Leon Road, and south of the Project site on Leon Road. Existing agricultural uses in the Project study area are located north, east, and southeast of the Project site. Vacant, residential-designated uses are located immediately north and south of the Project site boundaries, and to the east on Craig Avenue. The Interstate 215 (I-215) freeway right-of-way is located roughly 3 miles west of the Project site.

1.2 PROJECT DESCRIPTION

Consistent with the *Traffic Impact Analysis*, potential impacts have been assessed for two development phases. Exhibit 1-B identifies the proposed land use and planning areas which are included in Phase 1 and Phase 2. In addition to the Project, this noise study analyzes off-site improvements including a channel, sewer line, and lift station associated with Project construction. The two phases and their anticipated opening years are as follows:

- Phase 1 (2021) – 317 single-family residential units and an 8.2-acre park.
- Phase 2 (2025) – Phase 1 development plus 257 additional single-family residential units.

EXHIBIT 1-A: LOCATION MAP

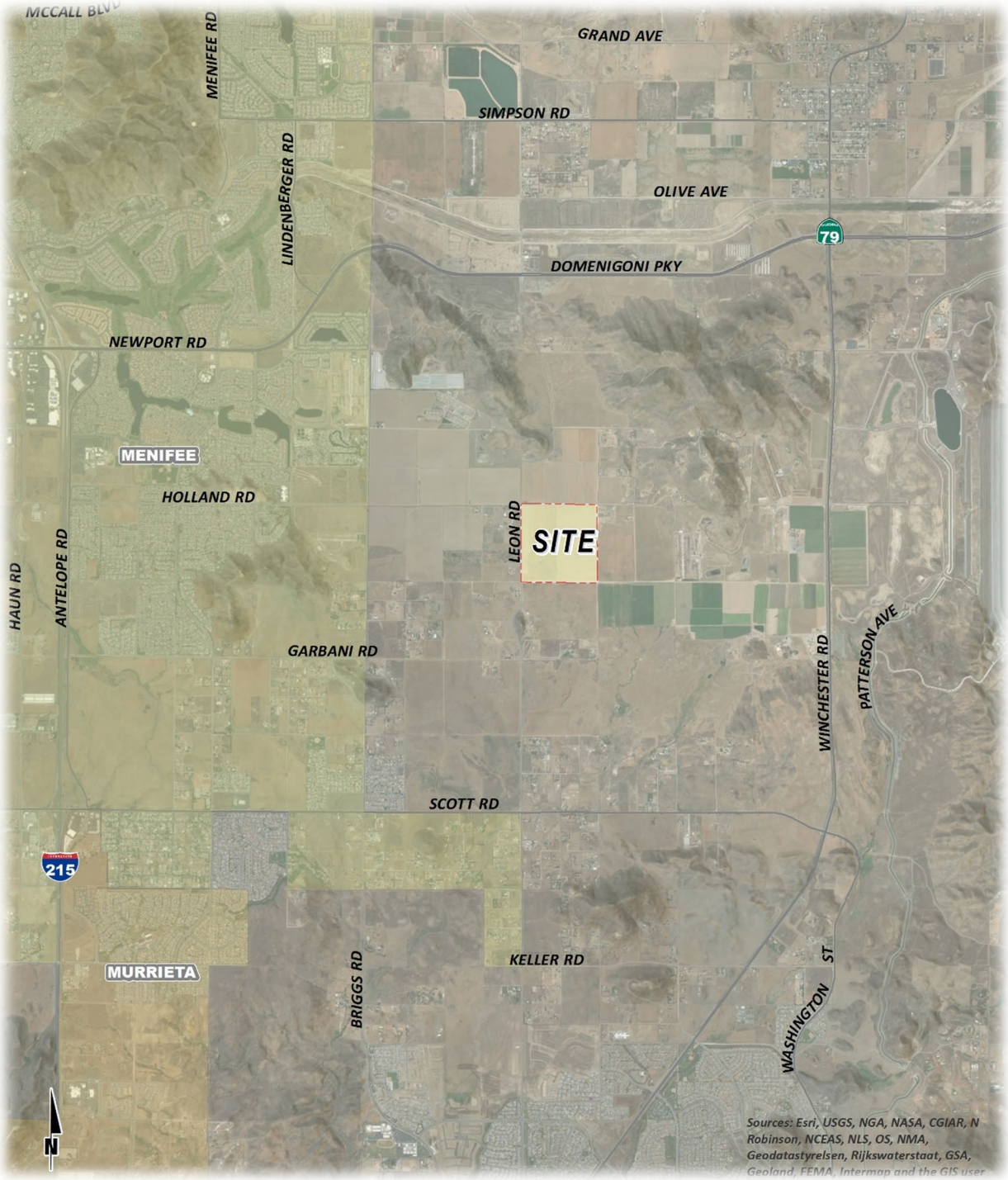
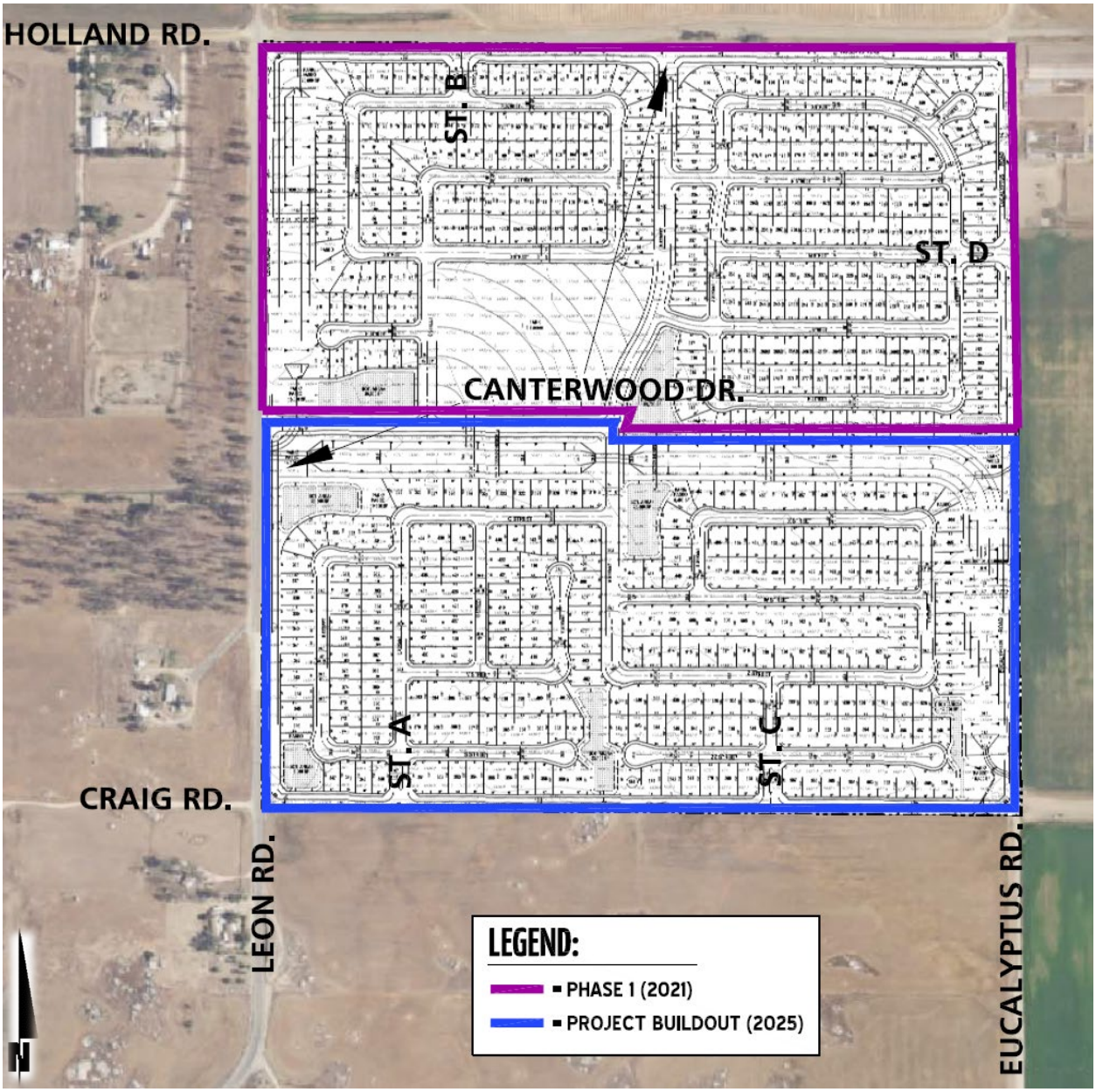


EXHIBIT 1-B: SITE PLAN



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2 FUNDAMENTALS

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

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (6) 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. (7) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

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

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

2.3 SOUND PROPAGATION

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

2.3.1 GEOMETRIC SPREADING

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

2.3.2 GROUND ABSORPTION

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

2.3.3 ATMOSPHERIC EFFECTS

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

2.3.4 SHIELDING

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

2.4 NOISE CONTROL

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

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receptor. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (8)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (9)

2.7 COMMUNITY RESPONSE TO NOISE

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

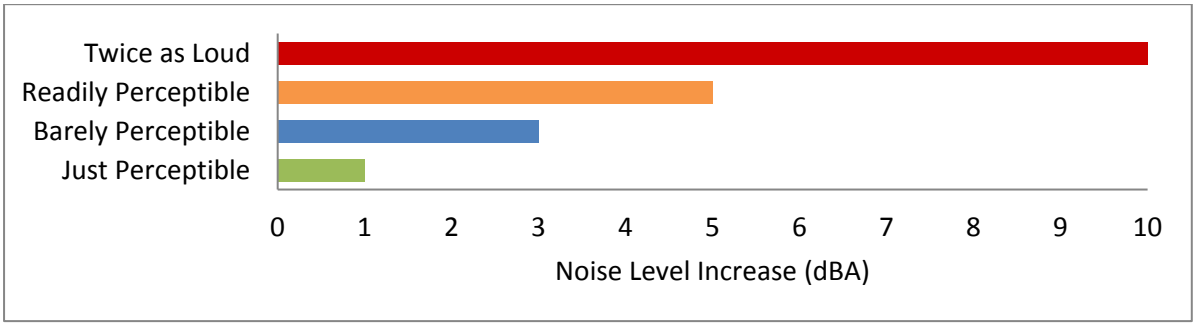
- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (10) 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. (10)

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*. (8)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 EXPOSURE TO HIGH NOISE LEVELS

The Occupational Safety and Health Administration (OSHA) sets legal limits on noise exposure in the workplace. The permissible exposure limit (PEL) for a worker over an eight-hour day is 90 dBA. The OSHA standard uses a 5 dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half. The National Institute for Occupational Safety and Health (NIOSH) has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dBA for eight hours to minimize occupational noise induced hearing loss. NIOSH also recommends a 3 dBA exchange rate so that every increase by 3 dBA doubles the amount of the noise and halves the recommended amount of exposure time. (11)

OSHA has implemented requirements to protect all workers in general industry (e.g. the manufacturing and the service sectors) for employers to implement a Hearing Conservation Program where workers are exposed to a time weighted average noise level of 85 dBA or higher over an eight-hour work shift. Hearing Conservation Programs require employers to measure noise levels, provide free annual hearing exams and free hearing protection, provide training, and conduct evaluations of the adequacy of the hearing protectors in use unless changes to tools, equipment and schedules are made so that they are less noisy and worker exposure to noise is less than the 85 dBA. This noise study does not evaluate the noise exposure of workers within a project or construction site based on CEQA requirements, and instead, evaluates Project-related operational and construction noise levels at the nearby sensitive receiver locations in the Project study area. Further, periodic exposure to high noise levels in short duration, such as Project construction, is typically considered an annoyance and not impactful to human health. It would take several years of exposure to high noise levels to result in hearing impairment. (12)

2.9 VIBRATION

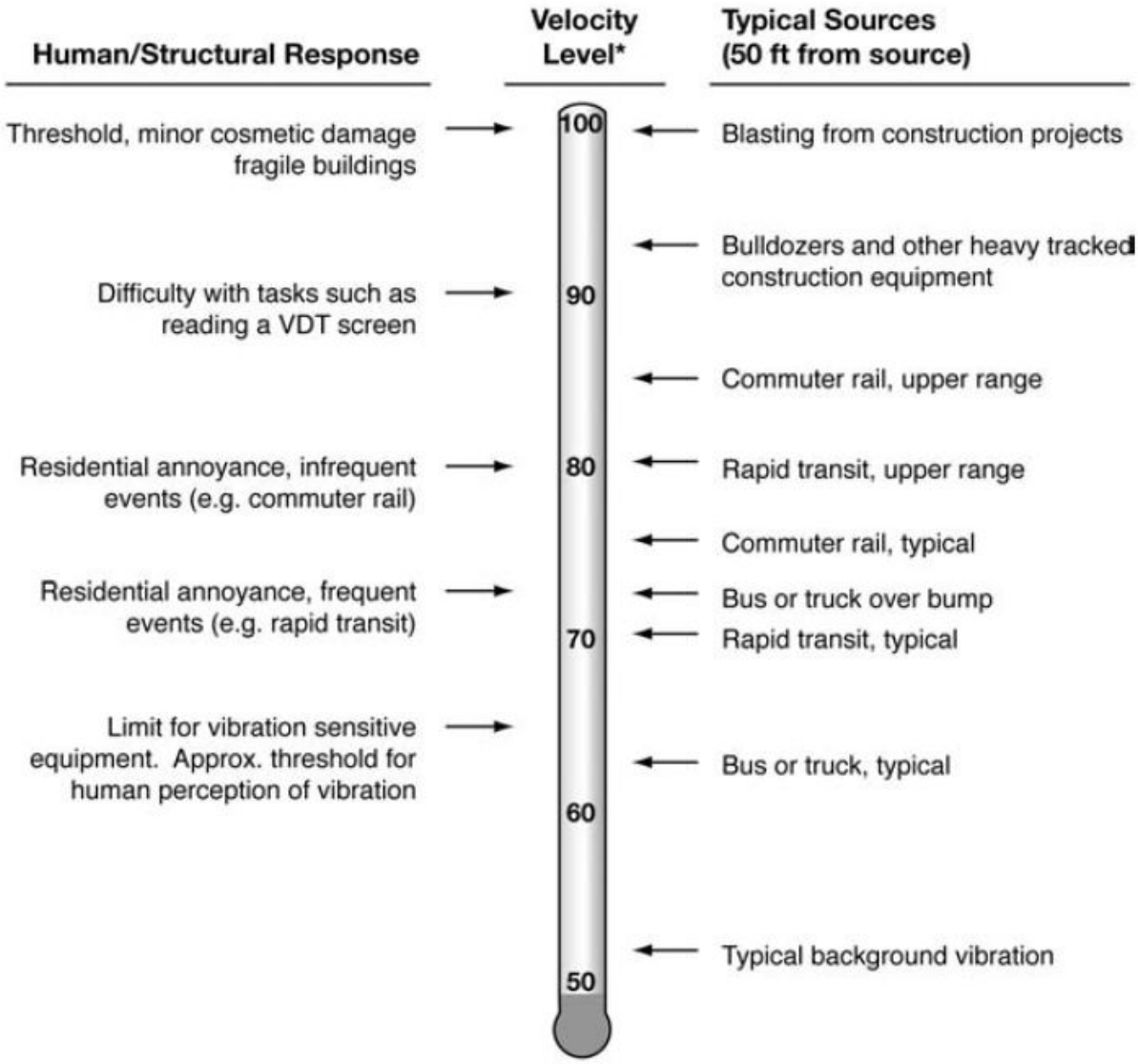
According to the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (4), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-

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.

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

3.2 STATE OF CALIFORNIA BUILDING CODE

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

3.3 COUNTY OF RIVERSIDE GENERAL PLAN NOISE ELEMENT

County of Riverside has adopted a Noise Element of the General Plan to control and abate environmental noise, and to protect the citizens of County of Riverside from excessive exposure to noise. (14) The Noise Element specifies the maximum allowable exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports and railroads. In addition, the Noise Element identifies several polices to minimize the impacts of excessive noise levels throughout the community and establishes noise level requirements for

all land uses. To protect County of Riverside residents from excessive noise, the Noise Element contains the following policies related to the Project:

N 1.1 Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land use cannot be relocated, then noise buffers such as setbacks, landscaping, or block walls shall be used.

N 1.3 Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL:

- *Schools*
- *Hospitals*
- *Rest Homes*
- *Long Term Care Facilities*
- *Mental Care Facilities*
- *Residential Uses*
- *Libraries*
- *Passive Recreation Uses*
- *Places of Worship*

N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County.

N 1.7 Require proposed land uses, affected by unacceptable high noise levels, to have an acoustical specialist prepare a study of the noise problems and recommend structural and site design features that will adequately mitigate the noise problem.

N 4.1 Prohibit facility-related noise, received by any sensitive use, from exceeding the following worst-case noise levels:

a. 45 dBA 10-minute Leq between 10:00 p.m. and 7:00 a.m.;
b. 65 dBA 10-minute Leq between 7:00 a.m. and 10:00 p.m.

N 13.1 Minimize the impacts of construction noise on adjacent uses within acceptable standards.

N 13.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse impacts on surrounding areas.

N 13.3 Condition subdivision approval adjacent to developed/occupied noise-sensitive land uses (see policy N 1.3) by requiring the developer to submit a construction-related noise mitigation plan to the City for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project, through the use of such methods as:

i. Temporary noise attenuation fences;
ii. Preferential location and equipment; and
iii. Use of current noise suppression technology and equipment.

N 14.1 Enforce the California Building Standards that sets standards for building construction to mitigate interior noise levels to the tolerable 45 CNEL limit. These standards are utilized in conjunction with the Uniform Building Code by the County's Building Department to ensure that noise protection is provided to the public. Some design features may include extra-dense insulation, double-paned windows, and dense construction materials.

N 16.3 Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches/second over a range of 1 to 100 Hz.

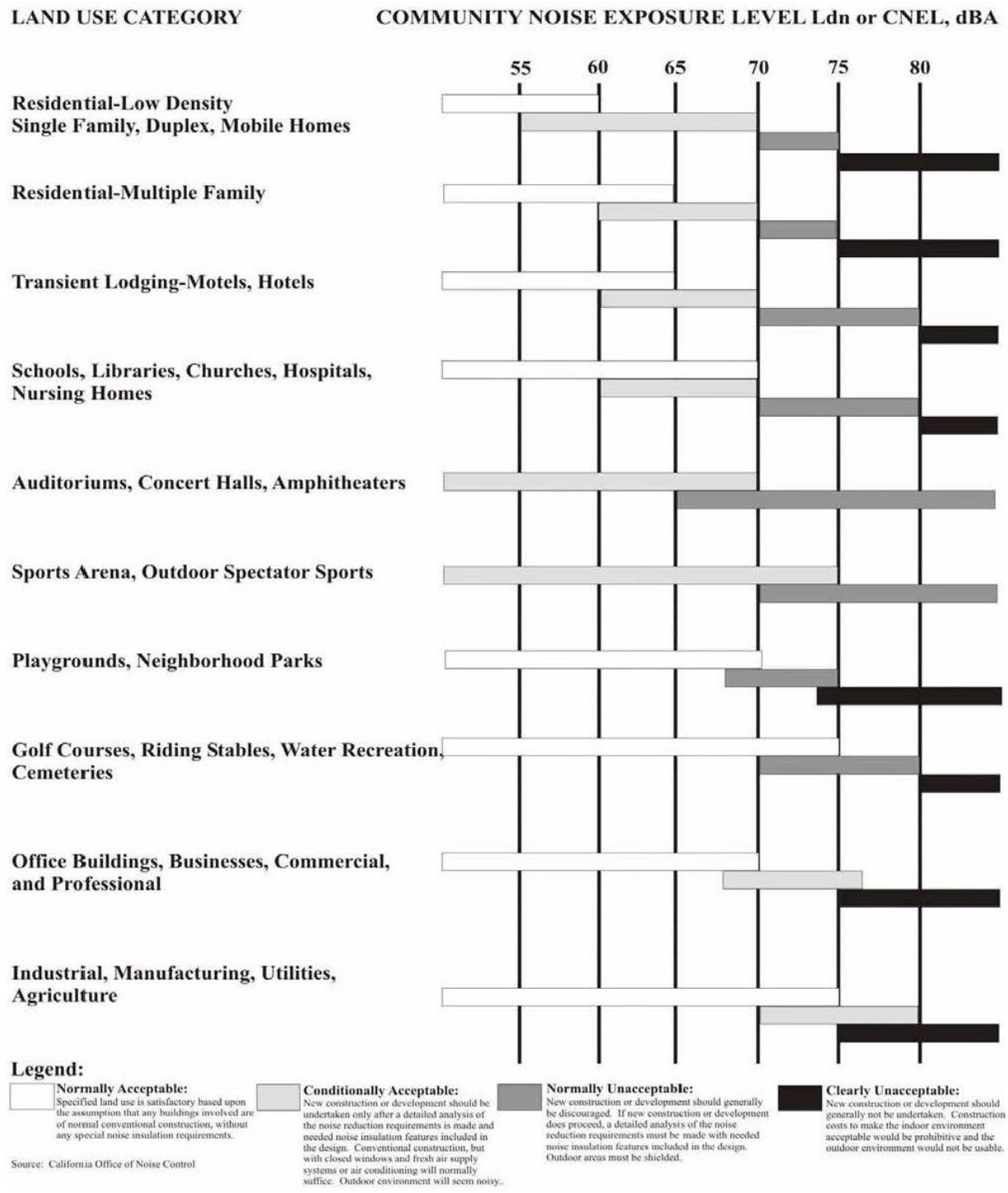
To ensure noise-sensitive land uses are protected from high levels of noise (N 1.1), Table N-1 of the Noise Element identifies guidelines to evaluate proposed developments based on exterior and interior noise level limits for land uses and requires a noise analysis to determine needed mitigation measures if necessary. The Noise Element identifies residential use as a noise-sensitive land use (N 1.3) and discourages new development in areas with 65 CNEL or greater existing ambient noise levels. To prevent and mitigate noise impacts for its residents (N 1.5), County of Riverside requires noise attenuation measures for sensitive land use exposed to noise levels higher than 65 CNEL. The intent of policy N 1.7 is to require a noise analysis for land uses impacted by unacceptably high noise levels and include mitigation measures in the design. Policy N 4.1 of the Noise Element sets a stationary-source exterior noise limit not to be exceeded for a cumulative period of more than ten minutes in any hour of 65 dBA L_{eq} for daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA L_{eq} during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m. To prevent high levels of construction noise from impacting noise-sensitive land uses, policies N 13.1 through 13.3 identify construction noise mitigation requirements for new development located near existing noise-sensitive land uses. Policy 16.3 establishes the vibration perception threshold for rail-related vibration levels, used in this analysis as a threshold for determining potential vibration impacts due to Project construction. (14)

3.3.1 LAND USE COMPATIBILITY

The noise criteria identified in the County of Riverside Noise Element (Table N-1) are guidelines to evaluate the land use compatibility of transportation related noise. The compatibility criteria, shown on Exhibit 3-A, provides the County 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* matrix describes categories of compatibility and not specific noise standards. Noise-sensitive residential land use is considered *normally acceptable* with exterior noise levels of less than 60 dBA CNEL, and *conditionally acceptable* with exterior noise levels approaching 70 dBA CNEL. For *conditionally acceptable* exterior noise levels, approaching 70 dBA CNEL for residential Project land uses, *new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and the needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice*. (14)

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



Source: County of Riverside General Plan Noise Element, Table N-1.

3.4 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Canterwood (Tentative Tract Map No. 37439) Project, noise from construction activities are typically limited to the hours of operation established under a jurisdiction's Municipal Code. To accurately describe the potential Project-related construction noise level contributions to the existing noise environment, this analysis presents the appropriate construction noise standards of the County of Riverside, as shown on Table 3-1.

Section 9.52.020 of the County's Noise Regulation ordinance, provided in Appendix 3.1, indicates that noise associated with any private construction activity located within one-quarter of a mile from an inhabited dwelling is considered exempt between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May. (15) However, neither the County of Riverside General Plan nor Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*.

3.4.1 CONSTRUCTION NOISE LEVEL THRESHOLD

To evaluate whether the Project will generate a substantial periodic increase in short-term noise levels at off-site sensitive receiver locations, a construction-related noise level threshold is adopted from the *Criteria for Recommended Standard: Occupational Noise Exposure* prepared by the National Institute for Occupational Safety and Health (NIOSH). (16) A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The construction related noise level threshold starts at 85 dBA for more than eight hours per day, and for every 3 dBA increase, the exposure time is cut in half. This results in noise level thresholds of 88 dBA for more than four hours per day, 92 dBA for more than one hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. (16) For the purposes of this analysis, the lowest, more conservative construction noise level threshold of 85 dBA L_{eq} is used as an acceptable threshold for construction noise at the nearby sensitive receiver locations. Since this construction-related noise level threshold represents the energy average of the noise source over a given time period, they are expressed as L_{eq} noise levels. Therefore, the noise level threshold of 85 dBA L_{eq} over a period of eight hours or more is used to evaluate the potential Project-related construction noise level impacts at the nearby sensitive receiver locations.

The 85 dBA L_{eq} threshold is also consistent with the FTA *Transit Noise and Vibration Impact Assessment* criteria for construction noise which identifies an hourly construction noise level threshold of 90 dBA L_{eq} during daytime hours, and 80 dBA L_{eq} during nighttime hours for construction for general assessment at residential uses. (4) Detailed assessment, according to the FTA, identifies an 8-hour dBA L_{eq} noise level threshold specific to residential uses of 80 dBA L_{eq}. Therefore, the Noise Study relies on the NIOSH 85 dBA L_{eq} threshold, consistent with FTA general and detailed assessment criteria for residential uses and represents an appropriate threshold for construction noise analysis.

3.4.2 CONSTRUCTION-RELATED HEARING CONSERVATION

The Occupational Safety and Health Administration (OSHA) requires hearing protection be provided by employers in workplaces where the noise levels may, over long periods of exposure to high noise levels, endanger the hearing of their employees. Standard 29 CFR, Part 1910 indicates the noise levels under which a hearing conservation program is required to be provided to workers exposed to high noise levels. (11) This analysis does not evaluate the noise exposure of construction workers within the Project site based on CEQA requirements, and instead, evaluates the Project-related construction noise levels at the nearby sensitive receiver locations in the Project study area. Further, periodic exposure to high noise levels in short duration, such as Project construction, is typically considered an annoyance and not impactful to human health. It would take several years of exposure to high noise levels to result in hearing impairment. (12)

TABLE 3-1: CONSTRUCTION NOISE STANDARDS

Jurisdiction	Permitted Hours of Construction Activity
County of Riverside	6:00 a.m. to 6:00 p.m. June to September; 7:00 a.m. to 6:00 p.m. October to May

Source: County of Riverside Municipal Code, Section 9.52.020 (I) (Appendix 3.2).

3.5 VIBRATION STANDARDS

The County of Riverside does not have vibration standards for temporary construction, but the County's General Plan Noise Element does contain the human reaction to typical vibration levels. Vibration levels with peak particle velocity of 0.787 inches per second are considered readily perceptible and above 0.1968 in/sec are considered annoying to people in buildings. Further, County of Riverside General Plan Policy N 16.3 identifies a motion velocity perception threshold for vibration due to passing trains of 0.01 inches per second (in/sec) over the range of one to 100 Hz. (14) For the purposes of this analysis, the perception threshold of 0.01 in/sec shall be used to assess the potential impacts due to Project construction at nearby sensitive receiver locations. Table 3-2 shows the County of Riverside vibration standard used in this analysis.

Typically, the human response at the perception threshold for vibration includes annoyance in residential areas as previously shown on Exhibit 2-B, when vibration levels expressed in vibration decibels (VdB) approach 75 VdB. County of Riverside, however, identifies a vibration perception threshold of 0.01 in/sec. For vibration levels expressed in velocity, the human body responds to the average vibration amplitude often described as the root-mean-square (RMS). The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a one-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to reduce the range of numbers used to describe human

response to vibration. Therefore, County of Riverside vibration standard of 0.01 in/sec in RMS velocity levels is used in this analysis to assess the human perception of vibration levels due to Project-related construction activities.

TABLE 3-2: VIBRATION NOISE STANDARDS

Jurisdiction	Root-Mean-Square (RMS) Velocity (in/sec)
County of Riverside[1]	0.01

[1] Source: County of Riverside General Plan Noise Element, Policy N 16.3.

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4 SIGNIFICANCE CRITERIA

The following significance criteria are based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this report, impacts would be potentially significant if the Project 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 County of Riverside 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. The Project site is not located within two miles of an airport or the vicinity of a private airstrip which would require additional noise analysis under CEQA guidelines E and F. Therefore, the potential impacts under CEQA guidelines E and F are *less than significant* and are not further analyzed in this noise study. 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.

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 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.* (17) 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. The Federal Interagency Committee on Noise (FICON) (18) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) or hourly logarithmic average noise levels (L_{eq}).

For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, 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. Per 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 County of Riverside General Plan Noise Element, Table 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 levels for non-noise-sensitive land uses is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* per the *Land Use Compatibility for Community Noise Exposure*. (14)

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 were 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 s for noise-sensitive land uses but instead rely on the County of Riverside General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure normally acceptable* 70 dBA CNEL exterior noise level criteria. Table 4.2 provides a summary of the noise impact significance criteria.

4.3 SIGNIFICANCE CRITERIA SUMMARY

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 CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project related noise level increase; or
    - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project noise level increase; or
    - already exceed 65 dBA CNEL, and the Project creates a community noise level impact of greater than 1.5 dBA CNEL (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g., commercial, etc.):
    - are less than the County of Riverside General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project related noise level increase; or
    - are greater than the County of Riverside General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project noise level increase.

ON-SITE TRAFFIC NOISE

- If the on-site exterior noise levels exceed 65 dBA CNEL at outdoor living areas (backyards) of the single-family residential land uses within the Project site. Interior noise levels shall not exceed 45 dBA CNEL for all residential land uses (County of Riverside General Plan Noise Element, Policies N 1.3 & N 14.1).

CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities:
    - occur at any time other than the permitted hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May (County of Riverside Municipal Code, Section 9.52.020); or

- generate noise levels which exceed the 85 dBA L_{eq} acceptable noise level threshold at the nearby sensitive receiver locations (NIOSH, Criteria for Recommended Standard: Occupational Nosie Exposure).

- If short-term Project generated construction vibration levels exceed the County of Riverside acceptable vibration standard of 0.01 in/sec RMS at sensitive receiver locations (County of Riverside General Plan, Policy N 16.3).

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Jurisdiction	Condition(s)	Significance Criteria	
				Daytime	Nighttime
Off-Site	Noise-Sensitive[1]	All	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[2]		if ambient is < 70 dBA CNEL	≥ 5 dBA CNEL Project increase	
			if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
On-Site	Residential[3]	County of Riverside	Exterior Noise Level Criteria	65 dBA CNEL	
			Interior Noise Level Standard	45 dBA CNEL	
Construction	Noise-Sensitive	County of Riverside	Permitted hours of 6:00 a.m. to 6:00 p.m. June to September; 7:00 a.m. to 6:00 p.m. October to May.[4]		
		All	Noise Level Threshold[5]	85 dBA L_{eq}	n/a
			Vibration Level Threshold[6]	0.01 in/sec RMS	n/a

[1] Source: FICON, 1992.
[2] Source: County of Riverside General Plan Noise Element, Table N-1.
[3] Source: County of Riverside General Plan Noise Element, Policies N 1.3 & N 14.1.
[4] Source: County of Riverside Municipal Code, Section 9.52.020 (I) (Appendix 3.2).
[5] Source: NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure, June 1998.
[6] Source: County of Riverside General Plan Noise Element, Policy N 16.3.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.; "n/a" = No nighttime construction activity is permitted, so no nighttime construction noise level limits are identified.

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, six 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, February 21st, 2018. 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. (19)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent any part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (6) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (4)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (4) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels

and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the noise levels west of the Project site on Leon Road near an existing residential home. The noise level measurements collected show an overall 24-hour exterior noise level of 64.4 dBA CNEL. The hourly noise levels measured at location L1 ranged from 56.1 to 64.3 dBA L_{eq} during the daytime hours and from 48.8 to 62.3 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 61.2 dBA L_{eq} with an average nighttime noise level of 56.1 dBA L_{eq}.
- Location L2 represents the noise levels west of the Project site on Leon Road near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 59.8 dBA CNEL. The hourly noise levels measured at location L2 ranged from 47.9 to 63.4 dBA L_{eq} during the daytime hours and from 40.5 to 54.5 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 57.2 dBA L_{eq} with an average nighttime noise level of 49.1 dBA L_{eq}.
- Location L3 represents the noise levels north of the Project site on Holland Road near existing agricultural uses. The 24-hour CNEL indicates that the overall exterior noise level is 56.8 dBA CNEL. At location L3 the background ambient noise levels ranged from 42.4 to 56.7 dBA L_{eq} during the daytime hours to levels of 43.3 to 53.8 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 51.0 dBA L_{eq} with an average nighttime noise level of 49.7 dBA L_{eq}.
- Location L4 represents the noise levels near the northeast Project site boundary adjacent to an existing agricultural use and residential home on Holland Road. The noise level measurements collected show an overall 24-hour exterior noise level of 54.0 dBA CNEL. The hourly noise levels measured at location L4 ranged from 39.5 to 59.1 dBA L_{eq} during the daytime hours and from 38.3 to 53.3 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 52.7 dBA L_{eq} with an average nighttime noise level of 45.3 dBA L_{eq}.
- Location L5 represents the noise levels on Eucalyptus Road adjacent to vacant land east of the Project site. The 24-hour CNEL indicates that the overall exterior noise level is 55.9 dBA CNEL. At location L5 the background ambient noise levels ranged from 43.7 to 60.2 dBA L_{eq} during the daytime hours to levels of 38.4 to 55.3 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 54.4 dBA L_{eq} with an average nighttime noise level of 47.3 dBA L_{eq}.
- Location L6 represents the noise levels south of the Project site adjacent to vacant land on Craig Avenue. The noise level measurements collected show an overall 24-hour exterior noise level of 50.1 dBA CNEL. The hourly noise levels measured at location L6 ranged from 39.8 to 54.3 dBA L_{eq} during the daytime hours and from 37.2 to 46.0 dBA L_{eq} during the nighttime hours. The energy

(logarithmic) average daytime noise level was calculated at 48.5 dBA L_{eq} with an average nighttime noise level of 41.6 dBA L_{eq}.

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.

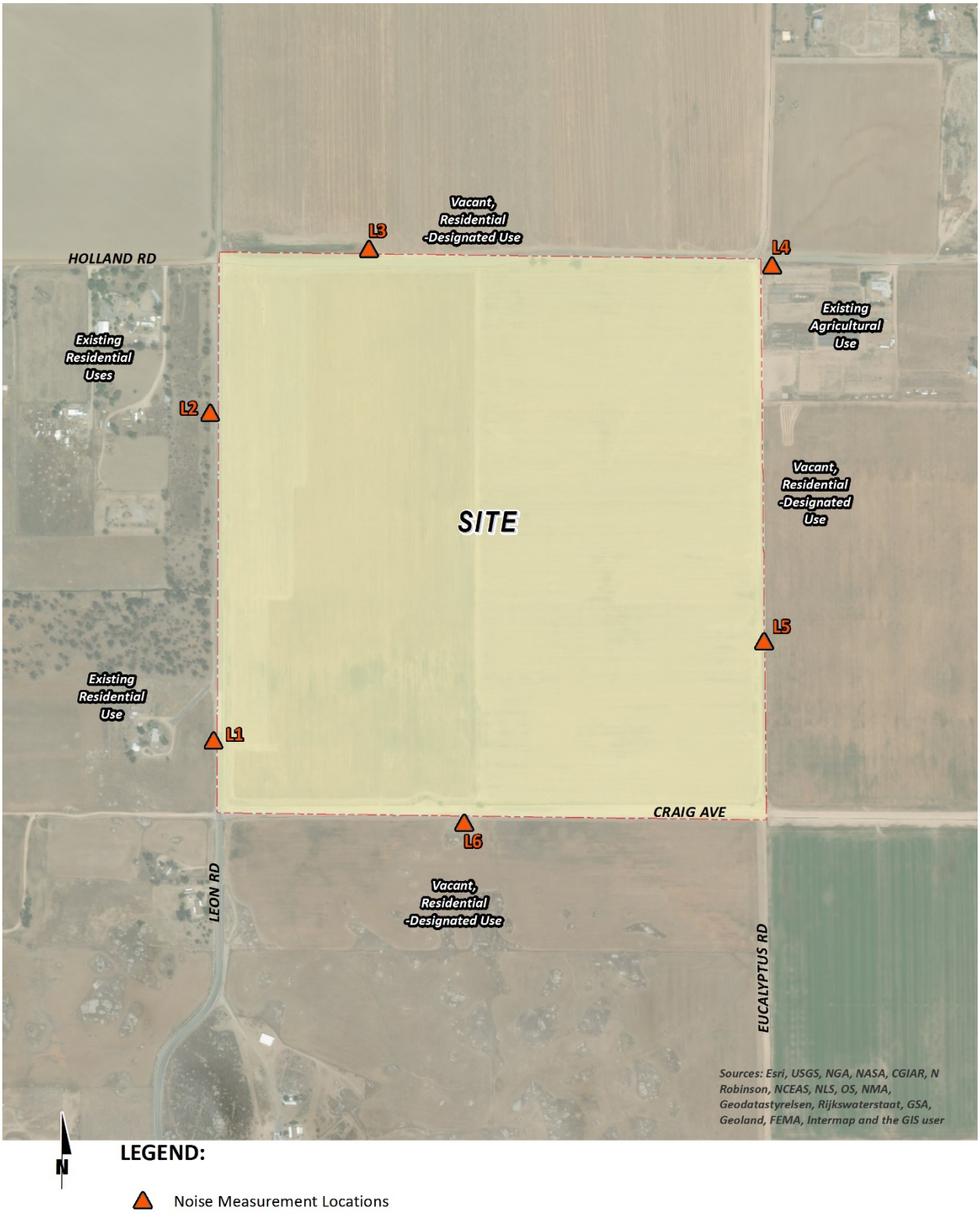
The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with the arterial roadway network. The 24-hour existing noise level measurements shown on Table 5-1 present the existing ambient noise conditions.

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

Location[1]	Distance to Project Boundary (Feet)	Description	Energy Average Hourly Noise Level (dBA L_{eq})[2]		CNEL
			Daytime	Nighttime	
L1	20'	Located west of the Project site on Leon Road near an existing residential home.	61.2	56.1	64.4
L2	40'	Located west of the Project site on Leon Road near existing residential homes.	57.2	49.1	59.8
L3	25'	Located north of the Project site on Holland Road near existing agricultural uses.	51.0	49.7	56.8
L4	53'	Located near the northeast Project site boundary adjacent to an existing agricultural use and residential home on Holland Road.	52.7	45.3	54.0
L5	0'	Located on Eucalyptus Road adjacent to vacant land east of the Project site.	54.4	47.3	55.9
L6	35'	Located south of the Project site adjacent to vacant land on Craig Avenue.	48.5	41.6	50.1

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average hourly levels. The long-term 24-hour measurement printouts 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.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS



6 METHODS AND PROCEDURES

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

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The estimated roadway noise impacts from vehicular traffic were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (20) 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. (21) 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.

This is methodology is consistent with the County of Riverside Office of Industrial Hygiene *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures*, which specifically requires the FHWA RD-77-108 model to be used in analysis within the County's jurisdiction. (22)

6.1.1 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the 18 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per each applicable General Plan Circulation Element, and the vehicle speeds consistent with the *Canterwood (Tentative Tract Map No. 37439) Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) The average daily traffic volumes used for this study are presented on Table 6-2 for each scenario consistent with the *Traffic Impact Analysis.* For this analysis, soft site conditions are used to analyze the traffic noise impacts within the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. Caltrans' research has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model as used in this off-site traffic noise analysis. (23)

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Adjacent Land Use[1]	Distance from Centerline to Nearest Adjacent Land Use (Feet)[2]	Vehicle Speed (mph)[3]
1	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	59'	50
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	59'	50
3	Antelope Rd.	s/o Scott Rd.	Commercial	59'	50
4	Menifee Rd.	n/o Holland Rd.	Residential	64'	45
5	Menifee Rd.	s/o Holland Rd.	Residential	64'	45
6	Leon Rd.	s/o Craig Av.	Residential	59'	35
7	Leon Rd.	s/o Garbani Rd.	Residential	59'	55
8	Leon Rd.	s/o Scott Rd.	Residential	59'	55
9	Holland Rd.	w/o Menifee Rd.	Residential	59'	45
10	Holland Rd.	e/o Menifee Rd.	Residential	59'	45
11	Holland Rd.	w/o Briggs Rd.	Residential	59'	45
12	Holland Rd.	w/o Leon Rd.	Residential	59'	45
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	76'	50
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	76'	50
15	Scott Rd.	w/o Menifee Rd.	Residential	76'	55
16	Scott Rd.	w/o Briggs Rd.	Residential	76'	55
17	Scott Rd.	w/o Leon Rd.	Residential	76'	55
18	Scott Rd.	e/o Leon Rd.	Residential	76'	55

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[2] Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the County of Riverside and City of Menifee General Plan Circulation Elements.
[3] Source: Canterwood (Tentative Tract Map No. 37439) Traffic Impact Analysis, February 2018.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic (1,000's)[1]										
			Existing			EA 2021		EA 2025		EAC 2021		EAC 2025	
			Without Project	With Phase 1	With Buildout	Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Haun Rd.	n/o Scott Rd.	6.7	6.9	7.1	7.1	7.3	7.7	8.1	18.2	18.4	22.4	22.8
2	Zeiders Rd.	s/o Scott Rd.	1.2	1.3	1.3	1.3	1.4	1.4	1.5	5.6	5.7	7.2	7.3
3	Antelope Rd.	s/o Scott Rd.	10.6	10.8	11.0	11.3	11.5	12.1	12.5	15.9	16.1	18.3	18.7
4	Menifee Rd.	n/o Holland Rd.	6.0	6.2	6.4	6.4	6.6	6.9	7.3	13.7	13.9	16.7	17.1
5	Menifee Rd.	s/o Holland Rd.	5.3	5.4	5.5	5.7	5.8	6.1	6.3	14.1	14.2	17.4	17.6
6	Leon Rd.	s/o Craig Av.	0.4	2.9	5.0	0.4	2.9	0.4	5.0	1.8	4.3	3.0	7.6
7	Leon Rd.	s/o Garbani Rd.	0.7	3.2	5.3	0.8	3.3	0.8	5.4	2.6	5.1	3.2	7.8
8	Leon Rd.	s/o Scott Rd.	2.7	3.0	3.2	2.9	3.2	3.1	3.6	6.2	6.5	7.6	8.1
9	Holland Rd.	w/o Menifee Rd.	3.1	3.1	3.2	3.3	3.3	3.5	3.6	8.5	8.5	10.4	10.5
10	Holland Rd.	e/o Menifee Rd.	2.9	3.3	3.7	3.1	3.5	3.3	4.1	8.5	8.9	10.5	11.3
11	Holland Rd.	w/o Briggs Rd.	0.3	0.8	1.2	0.3	0.8	0.4	1.3	1.3	1.8	1.6	2.5
12	Holland Rd.	w/o Leon Rd.	n/a	0.7	1.1	0.2	0.7	0.2	1.1	0.6	1.1	0.8	1.7
13	Scott Rd.	w/o Haun Rd.	10.6	10.8	11.0	11.2	11.4	12.2	12.6	18.2	18.4	21.4	21.8
14	Scott Rd.	e/o Haun Rd.	15.5	16.0	16.5	16.5	17.0	17.8	18.8	30.0	30.5	35.8	36.8
15	Scott Rd.	w/o Menifee Rd.	14.0	16.1	17.7	14.8	16.9	16.1	19.8	26.5	28.6	31.7	35.4
16	Scott Rd.	w/o Briggs Rd.	11.7	13.8	15.5	12.4	14.5	13.4	17.2	23.2	25.3	27.8	31.6
17	Scott Rd.	w/o Leon Rd.	11.3	13.3	15.0	12.0	14.0	13.0	16.7	19.9	21.9	23.5	27.2
18	Scott Rd.	e/o Leon Rd.	5.1	5.4	5.5	5.4	5.7	5.9	6.3	10.7	11.0	13.0	13.4

[1] Source: Canterwood (Tentative Tract Map No. 37439) Traffic Impact Analysis, February 2018.
"EA" = Existing plus Ambient Growth; "EAC" = Existing plus Ambient Growth plus Cumulative Developments; "n/a" = Roadway segment does is not yet paved (e.g., existing dirt road or the segment does not exist under the current scenario).

Table 6-3 presents the time of day vehicle splits and Table 6-4 presents the traffic flow distributions (vehicle mix) used for this analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks, and heavy trucks for input into the FHWA noise prediction model.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Riverside County (Expressway, Arterial, Major)				
Autos	77.50%	12.90%	9.60%	100.00%
Medium Trucks	84.80%	4.90%	10.30%	100.00%
Heavy Trucks	86.50%	2.70%	10.80%	100.00%
Riverside County (Secondary, Collector)				
Autos	75.55%	13.96%	10.49%	100.00%
Medium Trucks	48.91%	2.17%	48.91%	100.00%
Heavy Trucks	47.30%	5.41%	47.30%	100.00%

[1] Source: County of Riverside Office of Industrial Hygiene, 2017.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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

Classification	Total % Traffic Flow[1]			Total
	Autos	Medium Trucks	Heavy Trucks	
Major, Arterial, Urban Arterial	92.00%	3.00%	5.00%	100.00%
Secondary, Collector	97.42%	1.84%	0.74%	100.00%

[1] Source: County of Riverside Office of Industrial Hygiene.

6.1.2 ON-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

The on-site roadway parameters including the ADT volumes used for this study are presented on Table 6-5. Based on the County of Riverside General Plan Circulation Element, Leon Road is classified as a 4-lane Arterial, Holland Road is classified as a 4-lane Major, and Eucalyptus Road and Craig Avenue are classified as 4-lane Secondary roadways. The maximum two-way traffic volumes at a level of service C, shown on Table 6-5, were obtained from Figure C-3 of the County of Riverside General Plan Circulation Element and reflect future long-range traffic conditions needed to assess the future on-site traffic noise environment and to identify the appropriate noise mitigation measures that address the worst-case future noise conditions. (24) Consistent with the County of Riverside Office of Industrial Hygiene noise study requirements, hard site conditions were used to analyze the potential on-site traffic noise impacts for the Project study area. (22) Hard site conditions account for the sound propagation loss over a reflective surface between the source and the receiver.

TABLE 6-5: ON-SITE ROADWAY PARAMETERS

Roadway	Lanes	Classification[1]	Average Daily Traffic Volume[2]	Speed Limit (mph)[3]	Site Conditions[4]
Leon Rd.	4	Arterial	28,700	40	Hard
Holland Rd.	4	Major	27,300	40	Hard
Eucalyptus Rd.	4	Secondary	20,700	40	Hard
Craig. Av.	4	Secondary	20,700	40	Hard

[1] Road classifications based upon the County of Riverside General Plan Circulation Element.
[2] Source: County of Riverside General Plan Circulation Element, Figure C-3, based on the County of Riverside Office of Industrial Hygiene Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures.
[3] Roadway speeds are based on the County of Riverside Office of Industrial Hygiene 40 mph noise study guideline speed.
[4] Source: County of Riverside Office of Industrial Hygiene.

To predict the future noise environment at residential lots within the Project site, coordinate information was collected to identify the noise transmission path between the noise source and receiver. The coordinate information is based on the Project site plan, previously shown on Exhibit 1-B, showing the plotting of the residential lots in relationship to Leon Road, Holland Road, Eucalyptus Road, and Craig Avenue.

The outdoor living area (backyard) and first-floor exterior noise level receivers were placed five feet above the pad elevation, or three feet above the pad elevation (backyard) when the barrier height exceeds six feet per County of Riverside Office of Industrial Hygiene noise study guidelines. All second-floor receivers were located 14 feet above the proposed finished floor elevation.

6.2 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 6-6. 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 6-6: 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.

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 *Canterwood (Tentative Tract Map No. 37439) Traffic Impact Analysis*. (2) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- Existing Conditions Without / With Phase 1: This scenario refers to the existing present-day noise conditions without and with Phase 1 of the proposed Project.
- Existing Conditions Without / With Project Buildout: This scenario refers to the existing present-day noise conditions without and with Buildout of the proposed Project.
- Existing plus Ambient Growth (EA) Year 2021 Without / With Phase 1: This scenario refers to existing present-day noise conditions, plus ambient growth, without and with Phase 1 of the proposed Project.
- EA Year 2025 Without / With Project Buildout: This scenario refers to existing present-day noise conditions, plus ambient growth, without and with Buildout the proposed Project.
- EA plus Cumulative Developments (EAC) Year 2021 Without / With Phase 1: This scenario refers to existing present-day noise conditions, plus ambient growth, without and with Phase 1 of the proposed Project. This scenario includes all cumulative projects identified in the *Traffic Impact Analysis*.
- EAC Year 2025 Without / With Project Buildout: This scenario refers to existing present-day noise conditions, plus ambient growth, without and with Buildout the proposed Project. This scenario includes all cumulative projects identified in the *Traffic Impact Analysis*.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 and 7-11 present a summary of the exterior traffic noise levels, without barrier attenuation, for the 18 study area roadway segments analyzed from both the without Project to the with Project conditions under Existing, EA 2021, EA 2025, EAC 2021, and EAC 2025 conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	67.3	RW	84	180
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	59.8	RW	RW	RW
3	Antelope Rd.	s/o Scott Rd.	Commercial	69.3	RW	114	245
4	Menifee Rd.	n/o Holland Rd.	Residential	65.3	RW	67	144
5	Menifee Rd.	s/o Holland Rd.	Residential	64.7	RW	RW	132
6	Leon Rd.	s/o Craig Av.	Residential	56.8	RW	RW	RW
7	Leon Rd.	s/o Garbani Rd.	Residential	62.7	RW	RW	90
8	Leon Rd.	s/o Scott Rd.	Residential	68.6	RW	102	220
9	Holland Rd.	w/o Menifee Rd.	Residential	62.9	RW	RW	92
10	Holland Rd.	e/o Menifee Rd.	Residential	62.6	RW	RW	88
11	Holland Rd.	w/o Briggs Rd.	Residential	52.7	RW	RW	RW
12	Holland Rd.	w/o Leon Rd.	Residential	n/a	n/a	n/a	n/a
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	68.0	RW	121	261
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	69.7	RW	156	336
15	Scott Rd.	w/o Menifee Rd.	Residential	70.2	79	169	364
16	Scott Rd.	w/o Briggs Rd.	Residential	69.4	RW	150	323
17	Scott Rd.	w/o Leon Rd.	Residential	69.3	RW	147	316
18	Scott Rd.	e/o Leon Rd.	Residential	70.1	77	166	358

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.

[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.

"n/a" = Roadway segment does is not yet paved (e.g., existing dirt road or the segment does not exist under the current scenario).

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

ID	Road	Segment	Adjacent 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	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	67.4	RW	85	184
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	60.2	RW	RW	60
3	Antelope Rd.	s/o Scott Rd.	Commercial	69.4	RW	115	248
4	Menifee Rd.	n/o Holland Rd.	Residential	65.4	RW	68	147
5	Menifee Rd.	s/o Holland Rd.	Residential	64.8	RW	RW	134
6	Leon Rd.	s/o Craig Av.	Residential	65.4	RW	63	135
7	Leon Rd.	s/o Garbani Rd.	Residential	69.3	RW	114	247
8	Leon Rd.	s/o Scott Rd.	Residential	69.0	RW	110	236
9	Holland Rd.	w/o Menifee Rd.	Residential	62.9	RW	RW	92
10	Holland Rd.	e/o Menifee Rd.	Residential	63.1	RW	RW	96
11	Holland Rd.	w/o Briggs Rd.	Residential	57.0	RW	RW	RW
12	Holland Rd.	w/o Leon Rd.	Residential	61.1	RW	RW	70
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	68.1	RW	123	264
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	69.8	RW	159	343
15	Scott Rd.	w/o Menifee Rd.	Residential	70.8	86	186	400
16	Scott Rd.	w/o Briggs Rd.	Residential	70.1	78	168	361
17	Scott Rd.	w/o Leon Rd.	Residential	70.0	76	163	352
18	Scott Rd.	e/o Leon Rd.	Residential	70.4	80	173	372

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.

[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: EXISTING WITH PROJECT BUILDOUT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent 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	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	67.5	RW	87	187
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	60.2	RW	RW	60
3	Antelope Rd.	s/o Scott Rd.	Commercial	69.4	RW	117	251
4	Menifee Rd.	n/o Holland Rd.	Residential	65.5	RW	70	150
5	Menifee Rd.	s/o Holland Rd.	Residential	64.9	RW	RW	136
6	Leon Rd.	s/o Craig Av.	Residential	67.8	RW	90	194
7	Leon Rd.	s/o Garbani Rd.	Residential	71.5	74	160	345
8	Leon Rd.	s/o Scott Rd.	Residential	69.3	RW	114	247
9	Holland Rd.	w/o Menifee Rd.	Residential	63.0	RW	RW	94
10	Holland Rd.	e/o Menifee Rd.	Residential	63.6	RW	RW	103
11	Holland Rd.	w/o Briggs Rd.	Residential	58.8	RW	RW	RW
12	Holland Rd.	w/o Leon Rd.	Residential	63.1	RW	RW	95
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	68.2	RW	124	267
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	70.0	RW	163	350
15	Scott Rd.	w/o Menifee Rd.	Residential	71.2	92	198	426
16	Scott Rd.	w/o Briggs Rd.	Residential	70.7	84	181	390
17	Scott Rd.	w/o Leon Rd.	Residential	70.5	82	177	382
18	Scott Rd.	e/o Leon Rd.	Residential	70.4	81	175	377

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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: EA 2021 WITHOUT PHASE 1 CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent 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	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	67.5	RW	87	187
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	60.2	RW	RW	60
3	Antelope Rd.	s/o Scott Rd.	Commercial	69.5	RW	119	256
4	Menifee Rd.	n/o Holland Rd.	Residential	65.5	RW	70	150
5	Menifee Rd.	s/o Holland Rd.	Residential	65.0	RW	64	139
6	Leon Rd.	s/o Craig Av.	Residential	56.8	RW	RW	RW
7	Leon Rd.	s/o Garbani Rd.	Residential	63.3	RW	RW	98
8	Leon Rd.	s/o Scott Rd.	Residential	68.9	RW	107	231
9	Holland Rd.	w/o Menifee Rd.	Residential	63.1	RW	RW	96
10	Holland Rd.	e/o Menifee Rd.	Residential	62.9	RW	RW	92
11	Holland Rd.	w/o Briggs Rd.	Residential	53.0	RW	RW	RW
12	Holland Rd.	w/o Leon Rd.	Residential	56.0	RW	RW	RW
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	68.3	RW	126	271
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	70.0	RW	163	350
15	Scott Rd.	w/o Menifee Rd.	Residential	70.5	81	176	378
16	Scott Rd.	w/o Briggs Rd.	Residential	69.7	RW	156	336
17	Scott Rd.	w/o Leon Rd.	Residential	69.5	RW	153	329
18	Scott Rd.	e/o Leon Rd.	Residential	70.4	80	173	372

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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: EA 2021 WITH PHASE 1 CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent 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	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	67.7	RW	89	191
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	60.5	RW	RW	64
3	Antelope Rd.	s/o Scott Rd.	Commercial	69.6	RW	120	259
4	Menifee Rd.	n/o Holland Rd.	Residential	65.7	RW	71	153
5	Menifee Rd.	s/o Holland Rd.	Residential	65.1	RW	65	140
6	Leon Rd.	s/o Craig Av.	Residential	65.4	RW	63	135
7	Leon Rd.	s/o Garbani Rd.	Residential	69.5	RW	117	252
8	Leon Rd.	s/o Scott Rd.	Residential	69.3	RW	114	247
9	Holland Rd.	w/o Menifee Rd.	Residential	63.1	RW	RW	96
10	Holland Rd.	e/o Menifee Rd.	Residential	63.4	RW	RW	99
11	Holland Rd.	w/o Briggs Rd.	Residential	57.0	RW	RW	RW
12	Holland Rd.	w/o Leon Rd.	Residential	61.1	RW	RW	70
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	68.4	RW	127	274
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	70.1	77	166	357
15	Scott Rd.	w/o Menifee Rd.	Residential	71.0	89	192	413
16	Scott Rd.	w/o Briggs Rd.	Residential	70.4	80	173	373
17	Scott Rd.	w/o Leon Rd.	Residential	70.2	79	169	364
18	Scott Rd.	e/o Leon Rd.	Residential	70.6	83	179	386

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.

[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: EA 2025 WITHOUT PROJECT BUILDOUT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent 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	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	67.9	RW	92	198
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	60.5	RW	RW	64
3	Antelope Rd.	s/o Scott Rd.	Commercial	69.8	RW	124	267
4	Menifee Rd.	n/o Holland Rd.	Residential	65.9	RW	73	158
5	Menifee Rd.	s/o Holland Rd.	Residential	65.3	RW	67	145
6	Leon Rd.	s/o Craig Av.	Residential	56.8	RW	RW	RW
7	Leon Rd.	s/o Garbani Rd.	Residential	63.3	RW	RW	98
8	Leon Rd.	s/o Scott Rd.	Residential	69.2	RW	112	241
9	Holland Rd.	w/o Menifee Rd.	Residential	63.4	RW	RW	99
10	Holland Rd.	e/o Menifee Rd.	Residential	63.1	RW	RW	96
11	Holland Rd.	w/o Briggs Rd.	Residential	54.3	RW	RW	RW
12	Holland Rd.	w/o Leon Rd.	Residential	56.3	RW	RW	RW
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	68.6	RW	133	287
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	70.3	79	171	369
15	Scott Rd.	w/o Menifee Rd.	Residential	70.8	86	186	400
16	Scott Rd.	w/o Briggs Rd.	Residential	70.0	76	164	354
17	Scott Rd.	w/o Leon Rd.	Residential	69.9	RW	161	347
18	Scott Rd.	e/o Leon Rd.	Residential	70.7	85	183	395

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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: EA 2025 WITH PROJECT BUILDOUT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent 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	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	68.1	RW	95	205
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	60.8	RW	RW	67
3	Antelope Rd.	s/o Scott Rd.	Commercial	70.0	59	127	273
4	Menifee Rd.	n/o Holland Rd.	Residential	66.1	RW	76	164
5	Menifee Rd.	s/o Holland Rd.	Residential	65.5	RW	69	148
6	Leon Rd.	s/o Craig Av.	Residential	67.8	RW	90	194
7	Leon Rd.	s/o Garbani Rd.	Residential	71.6	75	162	350
8	Leon Rd.	s/o Scott Rd.	Residential	69.8	RW	124	267
9	Holland Rd.	w/o Menifee Rd.	Residential	63.5	RW	RW	101
10	Holland Rd.	e/o Menifee Rd.	Residential	64.1	RW	RW	111
11	Holland Rd.	w/o Briggs Rd.	Residential	59.1	RW	RW	RW
12	Holland Rd.	w/o Leon Rd.	Residential	63.1	RW	RW	95
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	68.8	RW	136	293
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	70.5	82	177	382
15	Scott Rd.	w/o Menifee Rd.	Residential	71.7	99	213	459
16	Scott Rd.	w/o Briggs Rd.	Residential	71.1	90	194	418
17	Scott Rd.	w/o Leon Rd.	Residential	71.0	88	190	410
18	Scott Rd.	e/o Leon Rd.	Residential	71.0	89	192	413

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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: EAC 2021 WITHOUT PHASE 1 CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent 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	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	71.6	76	163	351
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	66.5	RW	74	160
3	Antelope Rd.	s/o Scott Rd.	Commercial	71.0	69	149	321
4	Menifee Rd.	n/o Holland Rd.	Residential	68.9	RW	116	249
5	Menifee Rd.	s/o Holland Rd.	Residential	69.0	RW	118	254
6	Leon Rd.	s/o Craig Av.	Residential	63.3	RW	RW	98
7	Leon Rd.	s/o Garbani Rd.	Residential	68.4	RW	100	215
8	Leon Rd.	s/o Scott Rd.	Residential	72.2	83	178	383
9	Holland Rd.	w/o Menifee Rd.	Residential	67.3	RW	83	180
10	Holland Rd.	e/o Menifee Rd.	Residential	67.3	RW	83	180
11	Holland Rd.	w/o Briggs Rd.	Residential	59.2	RW	RW	RW
12	Holland Rd.	w/o Leon Rd.	Residential	60.6	RW	RW	65
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	70.4	81	174	374
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	72.6	112	242	522
15	Scott Rd.	w/o Menifee Rd.	Residential	73.0	120	259	558
16	Scott Rd.	w/o Briggs Rd.	Residential	72.4	110	237	510
17	Scott Rd.	w/o Leon Rd.	Residential	71.7	99	214	461
18	Scott Rd.	e/o Leon Rd.	Residential	73.3	127	273	587

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.

[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 7-9: EAC 2021 WITH PHASE 1 CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent 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	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	71.7	76	164	354
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	66.6	RW	75	162
3	Antelope Rd.	s/o Scott Rd.	Commercial	71.1	70	150	324
4	Menifee Rd.	n/o Holland Rd.	Residential	68.9	RW	117	251
5	Menifee Rd.	s/o Holland Rd.	Residential	69.0	RW	118	255
6	Leon Rd.	s/o Craig Av.	Residential	67.1	RW	82	176
7	Leon Rd.	s/o Garbani Rd.	Residential	71.3	72	156	337
8	Leon Rd.	s/o Scott Rd.	Residential	72.4	85	184	396
9	Holland Rd.	w/o Menifee Rd.	Residential	67.3	RW	83	180
10	Holland Rd.	e/o Menifee Rd.	Residential	67.5	RW	86	185
11	Holland Rd.	w/o Briggs Rd.	Residential	60.5	RW	RW	64
12	Holland Rd.	w/o Leon Rd.	Residential	63.1	RW	RW	95
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	70.4	81	175	377
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	72.6	114	245	528
15	Scott Rd.	w/o Menifee Rd.	Residential	73.3	126	272	587
16	Scott Rd.	w/o Briggs Rd.	Residential	72.8	116	251	541
17	Scott Rd.	w/o Leon Rd.	Residential	72.2	106	228	491
18	Scott Rd.	e/o Leon Rd.	Residential	73.4	129	278	598

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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 7-10: EAC 2025 WITHOUT PROJECT BUILDOUT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent 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	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	72.5	87	187	403
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	67.6	RW	88	189
3	Antelope Rd.	s/o Scott Rd.	Commercial	71.6	76	164	352
4	Menifee Rd.	n/o Holland Rd.	Residential	69.7	RW	132	284
5	Menifee Rd.	s/o Holland Rd.	Residential	69.9	RW	136	292
6	Leon Rd.	s/o Craig Av.	Residential	65.5	RW	64	138
7	Leon Rd.	s/o Garbani Rd.	Residential	69.3	RW	114	247
8	Leon Rd.	s/o Scott Rd.	Residential	73.1	95	204	439
9	Holland Rd.	w/o Menifee Rd.	Residential	68.1	RW	95	206
10	Holland Rd.	e/o Menifee Rd.	Residential	68.2	RW	96	207
11	Holland Rd.	w/o Briggs Rd.	Residential	60.1	RW	RW	60
12	Holland Rd.	w/o Leon Rd.	Residential	61.9	RW	RW	79
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	71.1	90	193	417
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	73.3	127	273	587
15	Scott Rd.	w/o Menifee Rd.	Residential	73.8	135	292	628
16	Scott Rd.	w/o Briggs Rd.	Residential	73.2	124	267	576
17	Scott Rd.	w/o Leon Rd.	Residential	72.5	111	239	515
18	Scott Rd.	e/o Leon Rd.	Residential	74.2	144	310	669

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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 7-11: EAC 2025 WITH PROJECT BUILDOUT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent 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	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	72.6	88	189	408
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	67.7	RW	89	191
3	Antelope Rd.	s/o Scott Rd.	Commercial	71.7	77	166	358
4	Menifee Rd.	n/o Holland Rd.	Residential	69.8	RW	134	289
5	Menifee Rd.	s/o Holland Rd.	Residential	69.9	RW	137	294
6	Leon Rd.	s/o Craig Av.	Residential	69.6	RW	119	257
7	Leon Rd.	s/o Garbani Rd.	Residential	73.2	96	207	447
8	Leon Rd.	s/o Scott Rd.	Residential	73.4	99	213	458
9	Holland Rd.	w/o Menifee Rd.	Residential	68.2	RW	96	207
10	Holland Rd.	e/o Menifee Rd.	Residential	68.5	RW	101	217
11	Holland Rd.	w/o Briggs Rd.	Residential	61.9	RW	RW	79
12	Holland Rd.	w/o Leon Rd.	Residential	65.0	RW	59	127
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	71.2	91	196	422
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	73.4	129	278	598
15	Scott Rd.	w/o Menifee Rd.	Residential	74.2	146	314	676
16	Scott Rd.	w/o Briggs Rd.	Residential	73.7	135	291	627
17	Scott Rd.	w/o Leon Rd.	Residential	73.1	122	263	567
18	Scott Rd.	e/o Leon Rd.	Residential	74.3	147	317	682

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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. The without Project exterior noise levels are expected to range from 52.7 to 70.2 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography.

7.2.1 EXISTING WITH PHASE 1 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-2 shows the Existing with Phase 1 conditions will range from 57.0 to 70.8 dBA CNEL. As shown on Table 7-12, Phase 1 Project traffic will generate noise level increases ranging from 0.0 to 8.6 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *potentially significant* under Existing with Phase 1 conditions at noise-sensitive the land uses adjacent to the roadway segments identified below:

- Leon Road south of Craig Avenue (Segment #6);
- Leon Road south of Garbani Road (Segment #7).

Due to low existing traffic volumes on these roadway segments, the Phase 1 Project traffic volume contributions would result in *potentially significant* off-site traffic noise level increases under Existing with Phase 1 conditions, even though this scenario will not actually occur until Phase 1 is built and occupied under Year 2021 conditions. All other roadway segments would experience *less than significant* off-site traffic noise level impacts.

7.2.2 EXISTING WITH PROJECT BUILDOUT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-3 shows the Existing with Project Buildout conditions will range from 58.8 to 71.5 dBA CNEL. As shown on Table 7-13, Project Buildout traffic will generate noise level increases ranging from 0.0 to 11.0 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *potentially significant* under Existing with Project Buildout conditions at the noise-sensitive land uses adjacent to the following roadway segments:

- Leon Road south of Craig Avenue (Segment #6);
- Leon Road south of Garbani Road (Segment #7);
- Holland Road west of Briggs Road (Segment #11).

Due to low existing traffic volumes on these roadway segments, the Project Buildout traffic volume contributions would result in *potentially significant* off-site traffic noise level increases under Existing with Project Buildout conditions, even though this scenario will not actually occur until the Project is built out and occupied under Year 2025 conditions. All other roadway segments would experience *less than significant* off-site traffic noise level impacts.

TABLE 7-12: EXISTING WITH PHASE 1 OFF-SITE TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Noise-Sensitive Land Use?	Threshold Exceeded?[3]
				No Project	With Project	Project Addition		
1	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	67.3	67.4	0.1	No	No
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	59.8	60.2	0.3	No	No
3	Antelope Rd.	s/o Scott Rd.	Commercial	69.3	69.4	0.1	No	No
4	Menifee Rd.	n/o Holland Rd.	Residential	65.3	65.4	0.1	Yes	No
5	Menifee Rd.	s/o Holland Rd.	Residential	64.7	64.8	0.1	Yes	No
6	Leon Rd.	s/o Craig Av.	Residential	56.8	65.4	8.6	Yes	Yes
7	Leon Rd.	s/o Garbani Rd.	Residential	62.7	69.3	6.6	Yes	Yes
8	Leon Rd.	s/o Scott Rd.	Residential	68.6	69.0	0.5	Yes	No
9	Holland Rd.	w/o Menifee Rd.	Residential	62.9	62.9	0.0	Yes	No
10	Holland Rd.	e/o Menifee Rd.	Residential	62.6	63.1	0.6	Yes	No
11	Holland Rd.	w/o Briggs Rd.	Residential	52.7	57.0	4.3	Yes	No
12	Holland Rd.	w/o Leon Rd.	Residential	n/a	n/a	n/a	n/a	n/a
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	68.0	68.1	0.1	No	No
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	69.7	69.8	0.1	No	No
15	Scott Rd.	w/o Menifee Rd.	Residential	70.2	70.8	0.6	Yes	No
16	Scott Rd.	w/o Briggs Rd.	Residential	69.4	70.1	0.7	Yes	No
17	Scott Rd.	w/o Leon Rd.	Residential	69.3	70.0	0.7	Yes	No
18	Scott Rd.	e/o Leon Rd.	Residential	70.1	70.4	0.2	Yes	No

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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).
"n/a" = Roadway segment does is not yet paved (e.g., existing dirt road or the segment does not exist under the current scenario).

TABLE 7-13: EXISTING WITH PROJECT BUILDOUT OFF-SITE TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Noise-Sensitive Land Use?	Threshold Exceeded?[3]
				No Project	With Project	Project Addition		
1	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	67.3	67.5	0.3	No	No
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	59.8	60.2	0.3	No	No
3	Antelope Rd.	s/o Scott Rd.	Commercial	69.3	69.4	0.2	No	No
4	Menifee Rd.	n/o Holland Rd.	Residential	65.3	65.5	0.3	Yes	No
5	Menifee Rd.	s/o Holland Rd.	Residential	64.7	64.9	0.2	Yes	No
6	Leon Rd.	s/o Craig Av.	Residential	56.8	67.8	11.0	Yes	Yes
7	Leon Rd.	s/o Garbani Rd.	Residential	62.7	71.5	8.8	Yes	Yes
8	Leon Rd.	s/o Scott Rd.	Residential	68.6	69.3	0.7	Yes	No
9	Holland Rd.	w/o Menifee Rd.	Residential	62.9	63.0	0.1	Yes	No
10	Holland Rd.	e/o Menifee Rd.	Residential	62.6	63.6	1.1	Yes	No
11	Holland Rd.	w/o Briggs Rd.	Residential	52.7	58.8	6.0	Yes	Yes
12	Holland Rd.	w/o Leon Rd.	Residential	n/a	n/a	n/a	n/a	n/a
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	68.0	68.2	0.2	No	No
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	69.7	70.0	0.3	No	No
15	Scott Rd.	w/o Menifee Rd.	Residential	70.2	71.2	1.0	Yes	No
16	Scott Rd.	w/o Briggs Rd.	Residential	69.4	70.7	1.2	Yes	No
17	Scott Rd.	w/o Leon Rd.	Residential	69.3	70.5	1.2	Yes	No
18	Scott Rd.	e/o Leon Rd.	Residential	70.1	70.4	0.3	Yes	No

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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).
"n/a" = Roadway segment does is not yet paved (e.g., existing dirt road or the segment does not exist under the current scenario).

7.3 EA 2021 PHASE 1 TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-4 presents the Existing plus Ambient Growth (EA) 2021 without Phase 1 Project conditions CNEL noise levels. The without Project exterior noise levels are expected to range from 53.0 to 70.5 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-5 shows the EA 2021 with Phase 1 conditions will range from 57.0 to 71.0 dBA CNEL. As shown on Table 7-14, Phase 1 Project traffic will generate noise level increases ranging from 0.0 to 8.6 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *potentially significant* under EA 2021 with Phase 1 conditions at noise-sensitive the land uses adjacent to the roadway segments identified below:

- Leon Road south of Craig Avenue (Segment #6);
- Leon Road south of Garbani Road (Segment #7);
- Holland Road west of Leon Road (Segment #12).

Due to low without Project traffic volumes on these roadway segments, the Phase 1 Project traffic volume contributions would result in *potentially significant* off-site traffic noise level increases under EA 2021 with Phase 1 conditions. All other roadway segments would experience *less than significant* off-site traffic noise level impacts.

TABLE 7-14: EA 2021 WITH PHASE 1 OFF-SITE TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Noise-Sensitive Land Use?	Threshold Exceeded?[3]
				No Project	With Project	Project Addition		
1	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	67.5	67.7	0.1	No	No
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	60.2	60.5	0.3	No	No
3	Antelope Rd.	s/o Scott Rd.	Commercial	69.5	69.6	0.1	No	No
4	Menifee Rd.	n/o Holland Rd.	Residential	65.5	65.7	0.1	Yes	No
5	Menifee Rd.	s/o Holland Rd.	Residential	65.0	65.1	0.1	Yes	No
6	Leon Rd.	s/o Craig Av.	Residential	56.8	65.4	8.6	Yes	Yes
7	Leon Rd.	s/o Garbani Rd.	Residential	63.3	69.5	6.2	Yes	Yes
8	Leon Rd.	s/o Scott Rd.	Residential	68.9	69.3	0.4	Yes	No
9	Holland Rd.	w/o Menifee Rd.	Residential	63.1	63.1	0.0	Yes	No
10	Holland Rd.	e/o Menifee Rd.	Residential	62.9	63.4	0.5	Yes	No
11	Holland Rd.	w/o Briggs Rd.	Residential	53.0	57.0	4.0	Yes	No
12	Holland Rd.	w/o Leon Rd.	Residential	56.0	61.1	5.1	Yes	Yes
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	68.3	68.4	0.1	No	No
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	70.0	70.1	0.1	No	No
15	Scott Rd.	w/o Menifee Rd.	Residential	70.5	71.0	0.6	Yes	No
16	Scott Rd.	w/o Briggs Rd.	Residential	69.7	70.4	0.7	Yes	No
17	Scott Rd.	w/o Leon Rd.	Residential	69.5	70.2	0.7	Yes	No
18	Scott Rd.	e/o Leon Rd.	Residential	70.4	70.6	0.2	Yes	No

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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 EA 2025 PROJECT BUILDOUT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-6 presents the EA 2025 without Project Buildout conditions CNEL noise levels. The without Project exterior noise levels are expected to range from 54.3 to 70.8 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-7 shows the EA 2025 with Project Buildout conditions will range from 59.1 to 71.7 dBA CNEL. As shown on Table 7-15, Project Buildout traffic will generate noise level increases ranging from 0.1 to 11.0 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *potentially significant* under EA 2025 with Project Buildout conditions at noise-sensitive the land uses adjacent to the roadway segments identified below:

- Leon Road south of Craig Avenue (Segment #6);
- Leon Road south of Garbani Road (Segment #7);
- Holland Road west of Leon Road (Segment #12).

Due to low without Project traffic volumes on these roadway segments, the Project Buildout traffic volume contributions would result in *potentially significant* off-site traffic noise level increases under EA 2025 with Project Buildout conditions. All other roadway segments would experience *less than significant* off-site traffic noise level impacts.

TABLE 7-15: EA 2025 WITH PROJECT BUILDOUT OFF-SITE TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Noise-Sensitive Land Use?	Threshold Exceeded?[3]
				No Project	With Project	Project Addition		
1	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	67.9	68.1	0.2	No	No
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	60.5	60.8	0.3	No	No
3	Antelope Rd.	s/o Scott Rd.	Commercial	69.8	70.0	0.1	No	No
4	Menifee Rd.	n/o Holland Rd.	Residential	65.9	66.1	0.2	Yes	No
5	Menifee Rd.	s/o Holland Rd.	Residential	65.3	65.5	0.1	Yes	No
6	Leon Rd.	s/o Craig Av.	Residential	56.8	67.8	11.0	Yes	Yes
7	Leon Rd.	s/o Garbani Rd.	Residential	63.3	71.6	8.3	Yes	Yes
8	Leon Rd.	s/o Scott Rd.	Residential	69.2	69.8	0.6	Yes	No
9	Holland Rd.	w/o Menifee Rd.	Residential	63.4	63.5	0.1	Yes	No
10	Holland Rd.	e/o Menifee Rd.	Residential	63.1	64.1	0.9	Yes	No
11	Holland Rd.	w/o Briggs Rd.	Residential	54.3	59.1	4.8	Yes	No
12	Holland Rd.	w/o Leon Rd.	Residential	56.3	63.1	6.8	Yes	Yes
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	68.6	68.8	0.1	No	No
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	70.3	70.5	0.2	No	No
15	Scott Rd.	w/o Menifee Rd.	Residential	70.8	71.7	0.9	Yes	No
16	Scott Rd.	w/o Briggs Rd.	Residential	70.0	71.1	1.1	Yes	No
17	Scott Rd.	w/o Leon Rd.	Residential	69.9	71.0	1.1	Yes	No
18	Scott Rd.	e/o Leon Rd.	Residential	70.7	71.0	0.3	Yes	No

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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 EAC 2021 PHASE 1 TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-8 presents the Existing plus Ambient Growth plus Cumulative Developments (EAC) 2021 without Phase 1 Project conditions CNEL noise levels. The without Project exterior noise levels are expected to range from 59.2 to 73.3 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-9 shows the EAC 2021 with Phase 1 conditions will range from 60.5 to 73.4 dBA CNEL. As shown on Table 7-16, Phase 1 Project traffic will generate noise level increases ranging from 0.0 to 3.8 dBA CNEL on the study area roadway

segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *potentially significant* under EAC 2021 with Phase 1 conditions at noise-sensitive the land uses adjacent to the roadway segments identified below:

- Leon Road south of Craig Avenue (Segment #6);
- Leon Road south of Garbani Road (Segment #7).

Due to low without Project traffic volumes on these roadway segments, the Phase 1 Project traffic volume contributions would result in *potentially significant* off-site traffic noise level increases under EAC 2021 with Phase 1 conditions. Note that with the addition of background traffic from cumulative developments in the Project study area, the Project increases will be reduced, however, Project-only off-site traffic noise level increases will still result in *potentially significant* impacts on roadway segments 6 and 7. All other roadway segments would experience *less than significant* off-site traffic noise level impacts.

TABLE 7-16: EAC 2021 WITH PHASE 1 OFF-SITE TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Noise-Sensitive Land Use?	Threshold Exceeded?[3]
				No Project	With Project	Project Addition		
1	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	71.6	71.7	0.0	No	No
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	66.5	66.6	0.1	No	No
3	Antelope Rd.	s/o Scott Rd.	Commercial	71.0	71.1	0.1	No	No
4	Menifee Rd.	n/o Holland Rd.	Residential	68.9	68.9	0.1	Yes	No
5	Menifee Rd.	s/o Holland Rd.	Residential	69.0	69.0	0.0	Yes	No
6	Leon Rd.	s/o Craig Av.	Residential	63.3	67.1	3.8	Yes	Yes
7	Leon Rd.	s/o Garbani Rd.	Residential	68.4	71.3	2.9	Yes	Yes
8	Leon Rd.	s/o Scott Rd.	Residential	72.2	72.4	0.2	Yes	No
9	Holland Rd.	w/o Menifee Rd.	Residential	67.3	67.3	0.0	Yes	No
10	Holland Rd.	e/o Menifee Rd.	Residential	67.3	67.5	0.2	Yes	No
11	Holland Rd.	w/o Briggs Rd.	Residential	59.2	60.5	1.4	Yes	No
12	Holland Rd.	w/o Leon Rd.	Residential	60.6	63.1	2.5	Yes	No
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	70.4	70.4	0.0	No	No
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	72.6	72.6	0.1	No	No
15	Scott Rd.	w/o Menifee Rd.	Residential	73.0	73.3	0.3	Yes	No
16	Scott Rd.	w/o Briggs Rd.	Residential	72.4	72.8	0.4	Yes	No
17	Scott Rd.	w/o Leon Rd.	Residential	71.7	72.2	0.4	Yes	No
18	Scott Rd.	e/o Leon Rd.	Residential	73.3	73.4	0.1	Yes	No

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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).

7.6 EAC 2025 PROJECT BUILDOUT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-10 presents the EAC 2025 without Project Buildout conditions CNEL noise levels. The without Project exterior noise levels are expected to range from 60.1 to 74.2 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-11 shows the EAC 2025 with Project Buildout conditions will range from 61.9 to 74.3 dBA CNEL. As shown on Table 7-17, Project Buildout traffic will generate noise level increases ranging from 0.0 to 4.4 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *potentially significant* under EAC 2025 with Project Buildout conditions at noise-sensitive the land uses adjacent to the roadway segments identified below:

- Leon Road south of Craig Avenue (Segment #6);
- Leon Road south of Garbani Road (Segment #7);
- Holland Road west of Leon Road (Segment #12).

Due to low without Project traffic volumes on these roadway segments, the Project Buildout traffic volume contributions would result in *potentially significant* off-site traffic noise level increases under EAC 2025 with Project Buildout conditions. Note that with the addition of background traffic from cumulative developments in the Project study area, the Project increases will be reduced, however, Project-only off-site traffic noise level increases will still result in *potentially significant* impacts on roadway segments 6, 7, and 12. All other roadway segments would experience *less than significant* off-site traffic noise level impacts.

TABLE 7-17: EAC 2025 WITH PROJECT BUILDOUT OFF-SITE TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Noise-Sensitive Land Use?	Threshold Exceeded?[3]
				No Project	With Project	Project Addition		
1	Haun Rd.	n/o Scott Rd.	Economic Dev. Corridor	72.5	72.6	0.1	No	No
2	Zeiders Rd.	s/o Scott Rd.	Economic Dev. Corridor	67.6	67.7	0.1	No	No
3	Antelope Rd.	s/o Scott Rd.	Commercial	71.6	71.7	0.1	No	No
4	Menifee Rd.	n/o Holland Rd.	Residential	69.7	69.8	0.1	Yes	No
5	Menifee Rd.	s/o Holland Rd.	Residential	69.9	69.9	0.0	Yes	No
6	Leon Rd.	s/o Craig Av.	Residential	65.5	69.6	4.0	Yes	Yes
7	Leon Rd.	s/o Garbani Rd.	Residential	69.3	73.2	3.9	Yes	Yes
8	Leon Rd.	s/o Scott Rd.	Residential	73.1	73.4	0.3	Yes	No
9	Holland Rd.	w/o Menifee Rd.	Residential	68.1	68.2	0.0	Yes	No
10	Holland Rd.	e/o Menifee Rd.	Residential	68.2	68.5	0.3	Yes	No
11	Holland Rd.	w/o Briggs Rd.	Residential	60.1	61.9	1.9	Yes	No
12	Holland Rd.	w/o Leon Rd.	Residential	61.9	65.0	3.1	Yes	Yes
13	Scott Rd.	w/o Haun Rd.	Economic Dev. Corridor	71.1	71.2	0.1	No	No
14	Scott Rd.	e/o Haun Rd.	Economic Dev. Corridor	73.3	73.4	0.1	No	No
15	Scott Rd.	w/o Menifee Rd.	Residential	73.8	74.2	0.5	Yes	No
16	Scott Rd.	w/o Briggs Rd.	Residential	73.2	73.7	0.6	Yes	No
17	Scott Rd.	w/o Leon Rd.	Residential	72.5	73.1	0.6	Yes	No
18	Scott Rd.	e/o Leon Rd.	Residential	74.2	74.3	0.1	Yes	No

[1] Sources: County of Riverside General Plan, Harvest Area Land Use Plan and the City of Menifee General Plan Land Use Map.
[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).

7.7 OFF-SITE PROJECT TRAFFIC NOISE LEVEL IMPACTS

The findings of this off-site traffic noise level analysis indicate that Project-related off-site traffic noise level increases will result in *potentially significant* noise impacts at noise-sensitive land uses adjacent to three of the 18 study area roadway segments, as identified below:

- Leon Road south of Craig Avenue (Segment #6);
- Leon Road south of Garbani Road (Segment #7);
- Holland Road west of Leon Road (Segment #12).

To reduce the *potentially significant* Project traffic noise level increases on study area roadways, potential noise mitigation measures are identified below. Potential mitigation using rubberized asphalt hot mix pavement is discussed below for the impacted roadway segments.

7.5.1 RUBBERIZED ASPHALT

Due to the potential noise attenuation benefits, rubberized asphalt is considered as a mitigation measure for the Project-related roadway improvements associated with Project construction. In an effort to reduce traffic noise levels at the noise source, Caltrans research has shown that rubberized asphalt can provide noise attenuation of approximately 4 dBA for automobile traffic noise levels. (25) Changing the pavement type of a roadway has been shown to reduce the amount of tire/pavement noise produced at the source under both near-term and long-term conditions. Traffic noise is generated primarily by the interaction of the tires and pavement, the engine, and exhaust systems. For automobiles noise, as much as 75 to 90-percent of traffic noise is generated by the interaction of the tires and pavement, especially when traveling at higher and constant speeds. (26) According to research conducted by Caltrans (25) and the Canadian Ministry of Transportation and Highways (27) a 4 dBA reduction in tire/pavement noise is attainable using rubberized asphalt under typical operating conditions. The 4 dBA reduction is the average reduction at distant receiving sites per the *I-80 Davis OGAC Pavement Noise Study* prepared in December 2002 and is used in this noise study as a conservative noise reduction so as to not overstate the effectiveness of rubberized asphalt mitigation over time.

By incorporating rubberized asphalt overlays into off-site roadway improvements within the County of Riverside, the off-site traffic noise level increases from automobile traffic can be reduced by roughly 4 dBA at the adjacent land uses. While rubberized asphalt will provide some noise reduction, this noise study recognizes that this is only effective for tire-on-pavement noise at higher speeds of Project automobile traffic, as rubberized asphalt would not reduce truck-related off-site traffic noise levels associated with truck engine and exhaust stacks to less than significant impacts.

While off-site Project-related traffic noise level increases at adjacent land uses under all scenarios would be reduced, a *significant and unavoidable* impact would remain at uses adjacent to Leon Road south of Craig Avenue (Segment #6). The use of rubberized asphalt mitigation by the Project would serve to reduce the noise level increases at neighboring noise-sensitive land uses and shall be required as an off-site traffic noise mitigation measure. The off-site roadway

segments within the County of Riverside requiring implementation of a rubberized asphalt hot mix overlay are listed below:

- Leon Road south of Craig Avenue (Segment #6);
- Leon Road south of Garbani Road (Segment #7);
- Holland Road west of Leon Road (Segment #12).

7.5.2 OFF-SITE NOISE BARRIERS

Existing and future noise-sensitive residential homes are and would be located adjacent to the impacted roadway segments in the Project study area, and therefore, off-site noise barriers are considered in this analysis as potential traffic noise mitigation to reduce the impacts at the noise-sensitive land uses. Off-site noise barriers are estimated to provide a *readily perceptible* 5 dBA reduction which, according to the FHWA, is *simple* to attain when blocking the line-of-sight from the noise source to the receiver. (8)

As previously discussed, Caltrans guidance in the Highway Design Manual, Section 1102.3(3), indicates that for design purposes, *the noise barrier should intercept the line of sight from the exhaust stack of a truck to the receptor*, and an 11.5-foot-high truck stack height is assumed to represent the truck engine and exhaust noise source. (28) Therefore, any exterior noise barriers at residential homes experiencing Project-related traffic noise level increases would need to be high enough and long enough to block the line-of-sight from the noise source (at 11.5 feet high per Caltrans) to the receiver (at 5 feet high per FHWA guidance) in order to provide a 5 dBA reduction per FHWA guidance. (8; 28) To break the line of sight, a minimum exterior noise barrier height of 8 feet is estimated to be required for the residential outdoor living areas adjacent to the impacted roadway segments. According to FHWA guidance, outdoor living areas are generally limited to outdoor living areas of frequent human use (e.g., backyards of single-family homes). Therefore, front and side yards of residential homes adjacent to off-site roadway segments do not represent noise-sensitive areas of frequent human use that require exterior noise mitigation. (8)

Exterior noise mitigation in the form of minimum 8-foot high noise barriers for the land uses adjacent to the impacted roadway segments is not anticipated to provide the FHWA attainable reduction of 5 dBA required to reduce the off-site traffic noise level increases as their construction would also require potential openings for driveway access for, and the approval of, individual residential lots adjacent to each road. As such, for this analysis, off-site noise barriers are not anticipated to reduce impacts at all impacted sensitive uses, and therefore, would not lower the off-site traffic noise levels below a level of significance.

7.5.3 SIGNIFICANT OFF-SITE TRAFFIC NOISE IMPACTS

Rubberized asphalt is considered as potential noise mitigation measure to reduce the *potentially significant* Project-related off-site traffic noise level increases under all with Project scenarios. However, this mitigation would not entirely eliminate the off-site traffic noise level increases associated with Project trips at the adjacent land uses, and will still result in a *significant and unavoidable* impact at one of the impacted roadway segments:

- Leon Road south of Craig Avenue (Segment #6).

A review of Nearmap aerial imagery (dated September 6, 2018) indicates that the existing land uses adjacent to Leon Road, south of Craig Avenue, include residential homes which have driveways and front yards adjacent to Leon Road. As such, off-site noise barriers at these locations are not considered as mitigation for these existing residential uses as they would not provide a continuous barrier required to provide the reduction previously described based on FHWA guidance due to driveway openings at Leon Road. Further, construction of off-site noise barriers may require approval of individual property owners and cannot be guaranteed by this noise study. Future residential uses adjacent to this roadway segment would be analyzed based on County of Riverside noise study guidelines which require a noise study be prepared which identifies exterior noise mitigation for each individual project based on future traffic conditions. Therefore, with the rubberized asphalt hot mix mitigation identified in this study, the impacts would be reduced but not eliminated at the existing sensitive uses adjacent to Leon Road, south of Craig Avenue.

Moreover, due to the low without Project traffic volumes on the impacted roadway segments, the addition of Project-only traffic volumes results in a *significant and unavoidable* impact with mitigation. Since many of these roadway segments are not yet built out to their Circulation Element classification specifications, the Project will be one of the earlier developments generating traffic on these roadway segments. All other roadway segments will experience *less than significant* off-site traffic noise level increases with Project traffic and the rubber asphalt mitigation, however, impacts on Segment 6 remain *significant and unavoidable*.

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8 ON-SITE TRANSPORTATION NOISE IMPACTS

An on-site exterior noise impact analysis has been completed to determine the traffic noise exposure and to identify potential necessary noise abatement measures for the proposed Canterwood (Tentative Tract Map No. 37439) Project. It is expected that the primary source of noise impacts to the Project site will be traffic noise from Leon Road, Holland Road, Eucalyptus Road, and Craig Avenue. The Project will also experience some background traffic noise impacts from the Project's internal local streets, however, due to the low traffic volume/speeds, traffic noise from these roads will not make a significant contribution to the noise environment beyond of the right-of-way of the roadways.

8.1 ON-SITE EXTERIOR NOISE ANALYSIS

Using the FHWA traffic noise prediction model and the parameters outlined in Tables 6-3 to 6-5, the expected future exterior noise levels at the outdoor living areas (backyards) of single-family lots were calculated. Table 8-1 presents a summary of future exterior noise level impacts at the outdoor living areas (backyards) within the Project site. The future unmitigated exterior traffic noise levels are shown to range from 65.3 to 75.1 dBA CNEL and exceed the County of Riverside 65 dBA CNEL standard for residential uses, therefore, impacts are considered *potentially significant*. The on-site traffic noise analysis calculations are provided in Appendix 5.1.

To satisfy the County of Riverside 65 dBA CNEL exterior noise level standards for residential land use, the construction of the following noise barriers is required:

- 8-foot high noise barriers for outdoor living areas (backyards) of lots 31 to 50, 136 to 149,151 to 153, and 334 to 340 adjacent to Leon Road and Holland Road;
- 6-foot high noise barriers for outdoor living areas (backyards) of lots 7 to 30, 154, 157 to 162, 287 to 296, 347 to 360, 464 to 472, and 558 to 574 adjacent to Eucalyptus Road and Craig Avenue.

With the recommended noise barriers shown on Exhibit ES-A, the mitigated future exterior noise levels will range from 59.7 to 64.6 dBA CNEL and impacts will be reduced to *less than significant*. This noise analysis shows that the recommended noise barriers will satisfy the County of Riverside 65 dBA CNEL exterior noise level standards for residential land use. The effective noise barrier height recommendations represent the minimum wall and/or berm combination height required to satisfy the County of Riverside exterior noise level standards.

TABLE 8-1: EXTERIOR NOISE LEVELS (CNEL)

Lot Number	Roadway	Unmitigated Exterior Noise Level (dBA CNEL)	Mitigated Exterior Noise Level (dBA CNEL)	Barrier Height (Feet)	Exterior Noise Level Threshold (dBA CNEL)[1]	Threshold Exceeded?
38	Holland Rd.	74.8	63.5	8.0'	65	No
146	Holland Rd.	74.8	64.6	8.0'	65	No
29	Leon Rd.	70.9	62.9	6.0'	65	No
344	Leon Rd.	75.1	64.3	8.0'	65	No
158	Eucalyptus Rd.	70.1	63.4	6.0'	65	No
472	Eucalyptus Rd.	65.3	59.7	6.0'	65	No
350	Craig. Av.	70.1	63.8	6.0'	65	No
564	Craig. Av.	70.0	63.8	6.0'	65	No

[1] Source: County of Riverside Office of Industrial Hygiene noise study guidelines.

8.2 ON-SITE INTERIOR NOISE ANALYSIS

To ensure that the interior noise levels comply with the County of Riverside 45 dBA CNEL interior noise standard for residential land use, future noise levels were calculated at the first and second-floor building façades.

8.2.1 NOISE REDUCTION METHODOLOGY

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

8.2.2 INTERIOR NOISE LEVEL ASSESSMENT

To provide the necessary interior noise level reduction, Tables 8-2 and 8-3 indicate that the residential homes within the Project site will require a windows-closed condition and a means of mechanical ventilation (e.g. air conditioning). Table 8-2 shows that the future unmitigated noise levels at first-floor building façades are expected to range from 59.8 to 67.8 dBA CNEL and standard windows and sliding glass doors with minimum sound transmission class (STC) ratings of 27 will satisfy the County of Riverside 45 dBA CNEL interior noise standard for residential land use.

Table 8-3 shows that the future unmitigated noise levels at second-floor building façades are expected to range from 65.1 to 74.5 dBA CNEL and upgraded windows and sliding glass doors with minimum STC ratings of 32 are required for all windows/glass doors facing Leon Road and Holland Road in lots 31 to 50, 136 to 149,151 to 153, and 334 to 340 to satisfy the County of Riverside 45 dBA CNEL interior noise standard for residential land use. All other residential lots will satisfy the County of Riverside 45 dBA CNEL interior noise standard for residential land use with standard second-floor windows/glass doors with minimum STC ratings of 27. Additional interior noise reduction recommendations are outlined in the Executive Summary.

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

Lot Number	Roadway	Noise Level @ Façade[1]	Required Interior NR[2]	Estimated Interior NR[3]	Upgraded Windows[4]	Interior Noise Level[5]	Threshold	Threshold Exceeded?
38	Holland Rd.	66.3	21.3	25.0	No	41.3	45	No
146	Holland Rd.	67.8	22.8	25.0	No	42.8	45	No
29	Leon Rd.	65.5	20.5	25.0	No	40.5	45	No
344	Leon Rd.	67.1	22.1	25.0	No	42.1	45	No
158	Eucalyptus Rd.	63.1	18.1	25.0	No	38.1	45	No
472	Eucalyptus Rd.	59.8	14.8	25.0	No	34.8	45	No
350	Craig. Av.	63.2	18.2	25.0	No	38.2	45	No
564	Craig. Av.	63.3	18.3	25.0	No	38.3	45	No

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

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

Lot Number	Roadway	Noise Level @ Façade[1]	Required Interior NR[2]	Estimated Interior NR[3]	Upgraded Windows[4]	Interior Noise Level[5]	Threshold	Threshold Exceeded?
38	Holland Rd.	74.2	29.2	30.0	Yes	44.2	45	No
146	Holland Rd.	74.2	29.2	30.0	Yes	44.2	45	No
29	Leon Rd.	70.7	25.7	30.0	Yes	40.7	45	No
344	Leon Rd.	74.5	29.5	30.0	Yes	44.5	45	No
158	Eucalyptus Rd.	69.4	24.4	25.0	No	44.4	45	No
472	Eucalyptus Rd.	65.1	20.1	25.0	No	40.1	45	No
350	Craig. Av.	69.4	24.4	25.0	No	44.4	45	No
564	Craig. Av.	69.3	24.3	25.0	No	44.3	45	No

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

9 RECEIVER LOCATIONS

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

Sensitive receiver locations near the Project site include existing residential homes and future residential-designated land use. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures.

R1: Located approximately 274 feet west of the Project site, R1 represents the existing residential home on Leon Road. A 24-hour noise level measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents existing residential homes west of the Project site across Leon Road at roughly 237 feet. A 24-hour noise level measurement was taken near this location, L2, to describe the existing ambient noise environment.

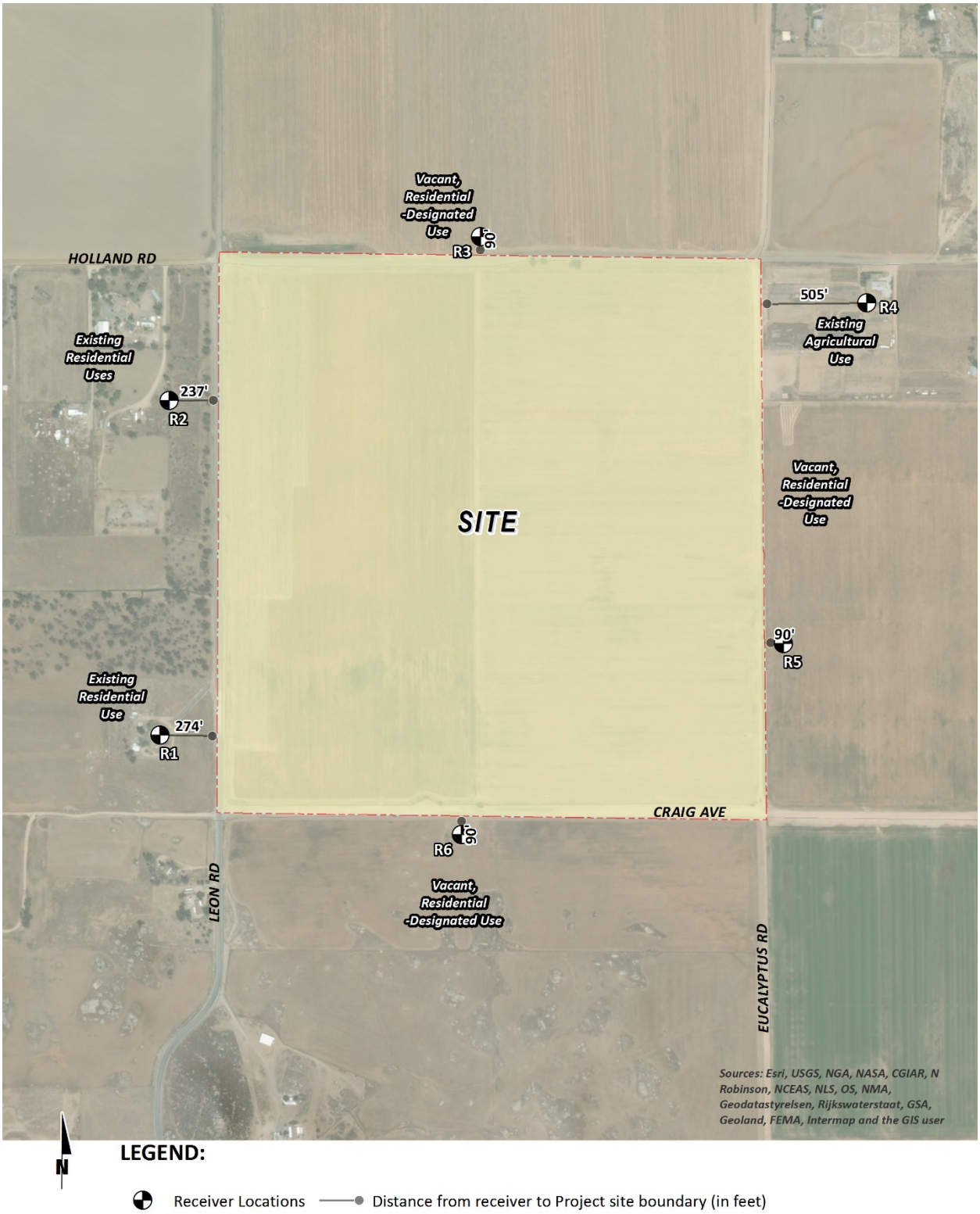
R3: Location R3 represents existing agricultural use and vacant land north of the Project site which is designated as residential land use at approximately 90 feet. A 24-hour noise level measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents existing residential home within agricultural use located approximately 505 feet east of the Project site. A 24-hour noise level measurement was taken near this location, L4, to describe the existing ambient noise environment.

R5: Location R5 represents vacant land east of the Project site which is designated as residential land use at approximately 90 feet. A 24-hour noise level measurement was taken near this location, L5, to describe the existing ambient noise environment.

R6: Location R6 represents vacant land south of the Project site which is designated as residential land use at approximately 90 feet. A 24-hour noise level measurement was taken near this location, L6, to describe the existing ambient noise environment.

EXHIBIT 9-A: RECEIVER LOCATIONS



10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-A shows the construction activity boundaries in relation to the nearby sensitive receiver locations.

10.1 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 stages:

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

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 represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 62 dBA to in excess of 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages used in this analysis are consistent with the data used to support the construction emissions in the *Canterwood (Tentative Tract Map No. 37439) Air Quality Impact Analysis* prepared by Urban Crossroads Inc. (29)

10.2 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 construction reference noise level measurements. Since the reference noise levels were collected at varying distances, all construction noise level measurements presented on Table 10-1 have been adjusted to describe a common reference distance of 50 feet.

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

ID	Noise Source	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA L_{eq})	Reference Noise Levels @ 50 Feet (dBA L_{eq})[6]
1	Truck Pass-Bys & Dozer Activity[1]	30'	63.6	59.2
2	Dozer Activity[1]	30'	68.6	64.2
3	Construction Vehicle Maintenance Activities[2]	30'	71.9	67.5
4	Foundation Trenching[2]	30'	72.6	68.2
5	Rough Grading Activities[2]	30'	77.9	73.5
6	Framing[3]	30'	66.7	62.3
7	Two Scrapers Pass-By[4]	30'	83.7	79.3
8	Concrete Mixer Truck Movements[5]	50'	71.2	71.2
9	Concrete Paver Activities[5]	30'	70.0	65.6
10	Concrete Mixer Pour & Paving Activities[5]	30'	70.3	65.9
11	Concrete Mixer Backup Alarms & Air Brakes[5]	50'	71.6	71.6
12	Concrete Mixer Pour Activities[5]	50'	67.7	67.7

[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).

10.3 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 10-8 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 unmitigated Project-related construction noise levels when the highest reference noise level is operating at a single point nearest the sensitive receiver location from the center of primary construction activity will range from 58.6 to 71.0 dBA L_{eq} at the sensitive receiver locations in the County of Riverside. Exhibit 10-A shows the construction activity noise source location and the distance to each nearby sensitive receiver location.

TABLE 10-2: SITE PREPARATION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	64.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	318'	-16.1	0.0	48.1
R2	282'	-15.0	0.0	49.1
R3	130'	-8.3	0.0	55.9
R4	540'	-20.7	0.0	43.5
R5	130'	-8.3	0.0	55.9
R6	130'	-8.3	0.0	55.9

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[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/berms in the Project study area.

TABLE 10-3: GRADING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Rough Grading Activities	73.5
Two Scrapers Pass-By	79.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	79.3

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	318'	-16.1	0.0	63.2
R2	282'	-15.0	0.0	64.2
R3	130'	-8.3	0.0	71.0
R4	540'	-20.7	0.0	58.6
R5	130'	-8.3	0.0	71.0
R6	130'	-8.3	0.0	71.0

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[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/berms in the Project study area.

TABLE 10-4: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Construction Vehicle Maintenance Activities	67.5
Foundation Trenching	68.2
Framing	62.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	68.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	318'	-16.1	0.0	52.1
R2	282'	-15.0	0.0	53.1
R3	130'	-8.3	0.0	59.9
R4	540'	-20.7	0.0	47.5
R5	130'	-8.3	0.0	59.9
R6	130'	-8.3	0.0	59.9

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[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/berms in the Project study area.

TABLE 10-5: PAVING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
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
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	71.6

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	318'	-16.1	0.0	55.5
R2	282'	-15.0	0.0	56.6
R3	130'	-8.3	0.0	63.3
R4	540'	-20.7	0.0	50.9
R5	130'	-8.3	0.0	63.3
R6	130'	-8.3	0.0	63.3

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[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/berms in the Project study area.

TABLE 10-6: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Framing	62.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	62.3

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	318'	-16.1	0.0	46.2
R2	282'	-15.0	0.0	47.2
R3	130'	-8.3	0.0	54.0
R4	540'	-20.7	0.0	41.6
R5	130'	-8.3	0.0	54.0
R6	130'	-8.3	0.0	54.0

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[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/berms in the Project study area.

OFF-SITE CONSTRUCTION ACTIVITY NOISE ANALYSIS

As a part of Project construction, an off-site channel, sewer line, and lift station will be constructed adjacent to receiver locations located further from the Project site. As such, this analysis identifies off-site receiver ("OR") locations, OR1 to OR5, adjacent to Project off-site construction activity locations as shown on Exhibit 10-A and described below:

OR1: This receiver location represents existing residential homes on Tres Lagos Drive.

OR2: This receiver location represents the existing Wilderness Lakes Recreational Vehicle Resort south of Tres Lagos Drive.

OR3: This receiver location represents existing residential homes on the northeast corner of Briggs Road and Tres Lagos Drive.

OR4: This receiver location represents the existing Wilderness Lakes Recreational Vehicle Resort west of Briggs Road.

OR5: This receiver location represents residential homes under construction on the southeast corner of Briggs Road and Holland Road.

Table 10-7 shows the off-site construction activity noise levels at both the off-site receiver locations, and receiver locations R1 and R2 which are located adjacent to the Project site and off-site construction activities. As shown on Table 10-7, off-site construction activity noise levels are expected to range from 44.5 to 68.2 dBA L_{eq} at distances ranging from 50 to 766 feet from off-site construction activities.

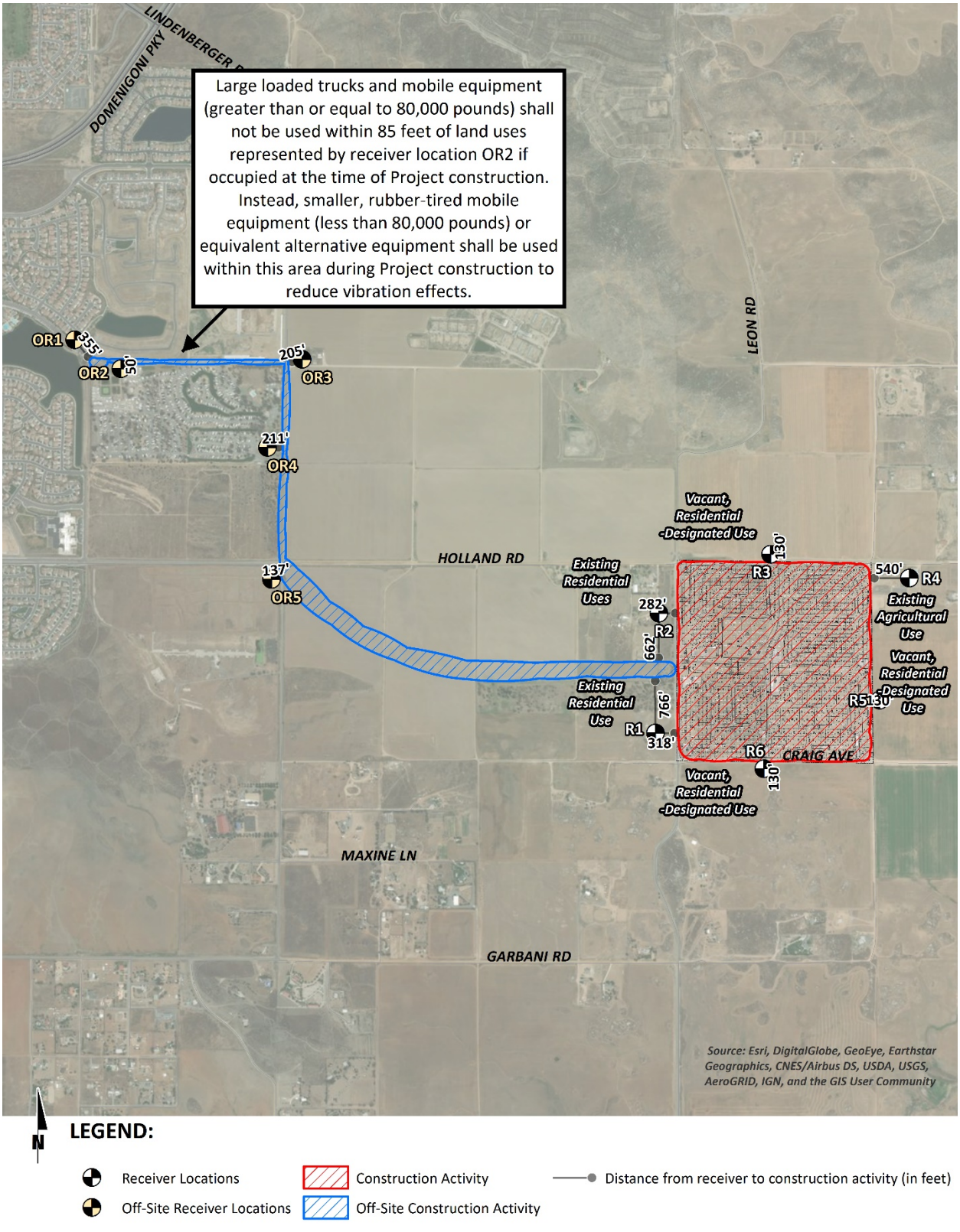
TABLE 10-7: OFF-SITE CONSTRUCTION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Foundation Trenching	68.2
Concrete Paver Activities	65.6
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	68.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
OR1	355'	-17.0	0.0	51.1
OR2	50'	0.0	0.0	68.2
OR3	205'	-12.3	0.0	55.9
OR4	211'	-12.5	0.0	55.7
OR5	137'	-8.8	0.0	59.4
R1	766'	-23.7	0.0	44.5
R2	662'	-22.4	0.0	45.7

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[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/berms in the Project study area.
"OR" = Off-Site Receiver

EXHIBIT 10-A: CONSTRUCTION ACTIVITY AND RECEIVER LOCATIONS



10.4 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

The construction noise analysis shows that the highest construction noise levels will occur when construction activities take place at the edge of primary Project construction activities. As shown on Table 10-8, the unmitigated construction noise levels are expected to range from 51.1 to 71.0 dBA L_{eq} at the sensitive receiver locations.

TABLE 10-8: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Level (dBA L_{eq})						
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Off-Site Channel & Sewer	Highest Activity Noise Levels[2]
R1	48.1	63.2	52.1	55.5	46.2	44.5	63.2
R2	49.1	64.2	53.1	56.6	47.2	45.7	64.2
R3	55.9	71.0	59.9	63.3	54.0	-	71.0
R4	43.5	58.6	47.5	50.9	41.6	-	58.6
R5	55.9	71.0	59.9	63.3	54.0	-	71.0
R6	55.9	71.0	59.9	63.3	54.0	-	71.0
OR1	-	-	-	-	-	51.1	51.1
OR2	-	-	-	-	-	68.2	68.2
OR3	-	-	-	-	-	55.9	55.9
OR4	-	-	-	-	-	55.7	55.7
OR5	-	-	-	-	-	59.4	59.4

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Estimated construction noise levels during peak operating conditions.
"OR" = Off-Site Receiver

Table 10-9 shows the highest on-site and off-site construction noise levels at the potentially impacted receiver locations approaching 71.0 dBA L_{eq} will satisfy the NIOSH 85 dBA L_{eq} significance threshold during temporary Project construction activities. Therefore, the unmitigated noise impact due to Project construction is considered *less than significant*.

TABLE 10-9: CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	63.2	85	No
R2	64.2	85	No
R3	71.0	85	No
R4	58.6	85	No
R5	71.0	85	No
R6	71.0	85	No
OR1	51.1	85	No
OR2	68.2	85	No
OR3	55.9	85	No
OR4	55.7	85	No
OR5	59.4	85	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Estimated construction noise levels during peak operating conditions, as shown on Table 10-8.
[3] Construction noise standards as shown on Table 4-2.
[4] Do the estimated Project construction noise levels satisfy the construction noise level threshold?

10.5 CONSTRUCTION VIBRATION IMPACTS

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

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

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include grading. Using the vibration source level of construction equipment provided on Table 6-6 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-10 presents the expected Project related vibration levels at each of the sensitive receiver locations.

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference velocity of 0.089 in/sec PPV at 25 feet. At distances ranging from 50 to 540 feet from the Project construction activities, construction vibration velocity levels are expected to range from 0.001 to 0.031 in/sec PPV, as shown on Table 10-10.

To assess the human perception of vibration levels in PPV, as previously discussed in Section 3, the velocities are converted to RMS vibration levels based on the Caltrans *Transportation and Construction Vibration Guidance Manual* conversion factor of 0.71. Table 10-11 shows the construction vibration levels in RMS are expected to range from 0.001 to 0.022 in/sec at the nearby sensitive receiver locations, which will exceed the County of Riverside vibration level threshold of 0.01 in/sec RMS at one off-site receiver location, OR2, if Project construction activities occur within 85 feet of occupied noise-sensitive receiver locations. Therefore, the Project-related vibration impacts will be *potentially significant* at receiver location OR2 during the off-site construction activities. All other receiver locations will experience *less than significant* vibration impacts due to Project construction.

TABLE 10-10: UNMITIGATED 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	318'	0.000	0.001	0.002	0.002	0.002	0.001	No
R2	282'	0.000	0.001	0.002	0.002	0.002	0.002	No
R3	130'	0.000	0.003	0.006	0.008	0.008	0.005	No
R4	540'	0.000	0.000	0.001	0.001	0.001	0.001	No
R5	130'	0.000	0.003	0.006	0.008	0.008	0.005	No
R6	130'	0.000	0.003	0.006	0.008	0.008	0.005	No
OR1	355'	0.000	0.001	0.001	0.002	0.002	0.001	No
OR2	50'	0.001	0.012	0.027	0.031	0.031	0.022	Yes
OR3	205'	0.000	0.001	0.003	0.004	0.004	0.003	No
OR4	211'	0.000	0.001	0.003	0.004	0.004	0.003	No
OR5	137'	0.000	0.003	0.006	0.007	0.007	0.005	No

[1] Receiver locations are shown on Exhibit 10-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-6.
[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 vibration level exceed the maximum acceptable vibration threshold?

Therefore, the use of large mobile equipment (greater than 80,000 pounds) and loaded trucks within 85 feet of nearby sensitive land uses shall be prohibited unless the vibration levels are shown to be less than the County of Riverside vibration level threshold of 0.01 in/sec RMS. Instead, smaller, rubber-tired mobile equipment (less than 80,000 pounds) or equivalent alternative equipment shall be used within 85 feet of sensitive land uses during Project construction to reduce vibration effects. Table 10-11 shows the mitigated Project construction vibration levels with the 85-foot buffer zone. With the recommended mitigation measures in this study, the Project-related vibration impacts at the nearby receiver locations represents a *less than significant* impact during the worst-case construction activities.

TABLE 10-11: MITIGATED 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		
OR2	50'	0.001	0.012	-	-	0.012	0.009	No

[1] Receiver locations are shown on Exhibit 10-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-6.
[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 vibration level exceed the maximum acceptable vibration threshold?

Further, the vibration levels due to Project construction do not represent vibration levels capable of causing building damage to nearby residential homes. The FTA identifies construction vibration levels capable of building damage ranging from 0.12 to 0.5 in/sec PPV. (4) The peak Project-construction vibration levels shown on Table 10-10, approaching 0.031 in/sec PPV, will remain below the FTA vibration levels for building damage at the residential homes near the Project site. Further, the levels at the site of the closest sensitive receivers are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

10.6 CONSTRUCTION VIBRATION MITIGATION MEASURES

The following mitigation measure is required to reduce construction vibration levels produced by the construction equipment to the nearby sensitive land uses.

- Large loaded trucks and mobile equipment (greater than or equal to 80,000 pounds) (5) shall not be used within 85 feet of land uses represented by receiver location OR2 if occupied at the time of Project construction, as shown on Exhibit ES-B. Instead, smaller, rubber-tired mobile equipment (less than 80,000 pounds) or equivalent alternative equipment shall be used within this area during Project construction to reduce vibration effects.

10.7 CONSTRUCTION NOISE AND VIBRATION BEST PRACTICES

Though construction noise and vibration are temporary, intermittent, will be short in duration, and will not present any long-term impacts, the following best practices would further reduce

noise and vibration levels produced by the construction equipment to the nearby sensitive residential land uses.

- Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that noise-generating Project construction activities shall only occur between the hours of 6:00 a.m. to 6:00 p.m. June through September, and 7:00 a.m. to 6:00 p.m. October through May (County of Riverside Municipal Code, Section 9.52.020). The Project construction supervisor shall ensure compliance with the note and the County shall conduct periodic inspection at its discretion.
- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the center).
- The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment (between the hours of 6:00 a.m. to 6:00 p.m. June through September, and 7:00 a.m. to 6:00 p.m. October through May). The contractor shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2017.
2. **Urban Crossroads, Inc.** *Canterwood (Tentative Tract Map No. 37439) Traffic Impact Analysis.* February 2018.
3. **Harris, Cyril M.** *Noise Control in Buildings.* s.l. : McGraw-Hill, Inc., 1994.
4. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* May 2006. FTA-VA-90-1003-06.
5. **Caterpillar.** *Caterpillar Perfomance Handbook.* January 2017.
6. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
7. **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.
8. **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.
9. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
10. **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.
11. **Occupational Safety and Health Administration.** *Standard 29 CRF, Part 1910.*
12. **Center for Disease Control and Prevention.** About Hearing Loss. [Online] [Cited: 04 15, 2016.] http://www.cdc.gov/healthyschools/noise/signs.htm.
13. **Office of Planning and Research.** *State of California General Plan Guidlines 2003.* October 2003.
14. **County of Riverside.** *General Plan Noise Element.* December 2015.
15. —. *Municipal Code, Title 9 - Public, Peace, Morals and Welfare, Chapter 9.52 - Noise Regulation.*
16. **National Institute for Occupational Safety and Health.** *Criteria for Recommended Standard: Occupational Noise Exposure.* June 1998.
17. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
18. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
19. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
20. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
21. **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.

22. **County of Riverside, Office of Industrial Hygiene.** *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures.* April 2015.
23. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
24. **County of Riverside.** *General Plan Circulation Element.* December 2015.
25. **California Department of Transportation Environmental Program.** *I-80 Davis OGAC Pavement Noise Study.* September 2001.
26. —. *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
27. **Canadian Ministry of Transportation and Highways, Highway Environment Branch.** *Open-Graded Asphalt 'Quiet Pavement' - Assessment of Traffic Noise Reduction Performance.* November 1995.
28. **California Department of Transportation.** *Highway Design Manual, Chapter 1100 Highway Traffic Noise Abatement.* May 2012.
29. **Urban Crossroads, Inc.** *Canterwood (Tentative Tract Map No. 37439) Air Quality Impact Analysis.* September 2018.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Canterwood (Tentative Tract Map No. 37439) 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.

Bill Lawson, P.E., INCE
Principal
URBAN CROSSROADS, INC.
260 E. Baker Street, Suite 200
Costa Mesa, CA 92626
(949) 336-5979
blawson@urbanxroads.com

EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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

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APPENDIX 3.1:

COUNTY OF RIVERSIDE MUNICIPAL CODE

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Chapter 9.52 - NOISE REGULATION

Sections:

9.52.010 - Intent.

At certain levels, sound becomes noise and may jeopardize the health, safety or general welfare of Riverside County residents and degrade their quality of life. Pursuant to its police power, the board of supervisors declares that noise shall be regulated in the manner described in this chapter. This chapter is intended to establish county-wide standards regulating noise. This chapter is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act and no such thresholds are established.

(Ord. 847 § 1, 2006)

9.52.020 - Exemptions.

Sound emanating from the following sources is exempt from the provisions of this chapter:

A. Facilities owned or operated by or for a governmental agency;

B. Capital improvement projects of a governmental agency;

C. The maintenance or repair of public properties;

D. Public safety personnel in the course of executing their official duties, including, but not limited to, sworn peace officers, emergency personnel and public utility personnel. This exemption includes, without limitation, sound emanating from all equipment used by such personnel, whether stationary or mobile;

E. Public or private schools and school-sponsored activities;

F. Agricultural operations on land designated "Agriculture" in the Riverside County general plan, or land zoned A-l (light agriculture), A-P (light agriculture with poultry), A-2 (heavy agriculture), A-D (agriculture-dairy) or C/V (citrus/vineyard), provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile;

G. Wind energy conversion systems (WECS), provided such systems comply with the WECS noise provisions of Riverside County Ordinance No. 348;

H. Private construction projects located one-quarter of a mile or more from an inhabited dwelling;

I. Private construction projects located within one-quarter of a mile from an inhabited dwelling, provided that:

1. Construction does not occur between the hours of six p.m. and six a.m. during the months of June through September, and

2. Construction does not occur between the hours of six p.m. and seven a.m. during the months of October through May;

J. Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of seven a.m. and eight p.m.;

K. Motor vehicles, other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems;

L. Heating and air conditioning equipment;

M. Safety, warning and alarm devices, including, but not limited to, house and car alarms, and other warning devices that are designed to protect the public health, safety, and welfare;

N. The discharge of firearms consistent with all state laws.

(Ord. 847 § 2, 2006)

APPENDIX 5.1:

STUDY AREA PHOTOS

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L1_E
33, 39' 51.590000", 117, 7' 9.980000"

L1_N
33, 39' 51.640000", 117, 7' 9.980000"

L1_S
33, 39' 51.640000", 117, 7' 9.980000"

L1_W
33, 39' 51.590000", 117, 7' 9.980000"

L2_E
33, 40' 7.170000", 117, 7' 10.310000"

L2_N
33, 40' 7.240000", 117, 7' 10.330000"

L2_S
33, 40' 7.240000", 117, 7' 10.330000"

L2_W
33, 40' 7.160000", 117, 7' 10.330000"

L3_E
33, 40' 14.960000", 117, 7' 1.410000"

L3_N
33, 40' 14.960000", 117, 7' 1.350000"

L3_S
33, 40' 14.970000", 117, 7' 1.410000"

L3_W
33, 40' 14.990000", 117, 7' 1.410000"

L4_E
33, 40' 14.370000", 117, 6' 38.560000"

L4_N
33, 40' 14.370000", 117, 6' 38.530000"

L4_S
33, 40' 14.370000", 117, 6' 38.530000"

L4_W
33, 40' 14.370000", 117, 6' 38.580000"

L5_E
33, 39' 56.560000", 117, 6' 38.800000"

L5_N
33, 39' 56.570000", 117, 6' 38.780000"

L5_S
33, 39' 56.570000", 117, 6' 38.780000"

L5_W
33, 39' 56.560000", 117, 6' 38.800000"

L6_E
33, 39' 47.840000", 117, 6' 55.720000"

L6_N
33, 39' 47.850000", 117, 6' 55.750000"

L6_S
33, 39' 47.850000", 117, 6' 55.750000"

L6_W
33, 39' 47.850000", 117, 6' 55.720000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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24-Hour Noise Level Measurement Summary

Project Name: Canterwood

Location: L1 - Located west of the Project site off of Leon Road near existing residential.

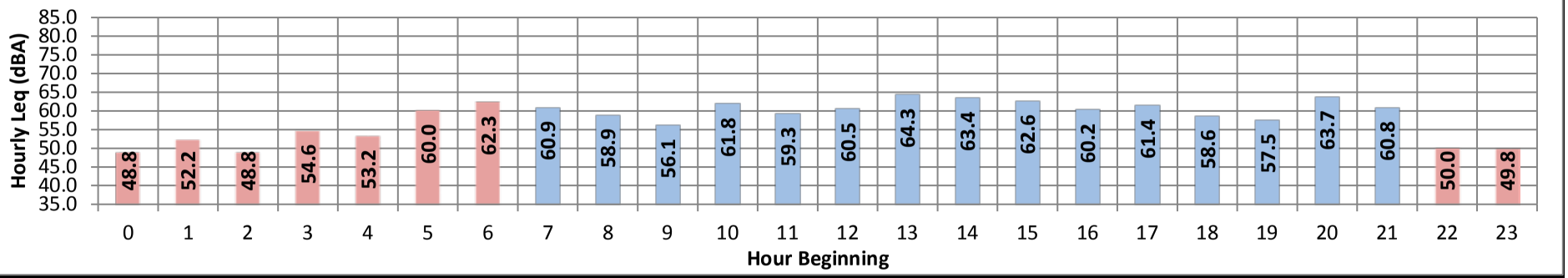
JN: 11304

Analyst: A. Wolfe

Date: 2/21/2018

Energy Average Leq		*24-Hour*
Day	*Night*	*CNEL*
61.2	56.1	64.4

Hourly Leq dBA Readings (unadjusted)



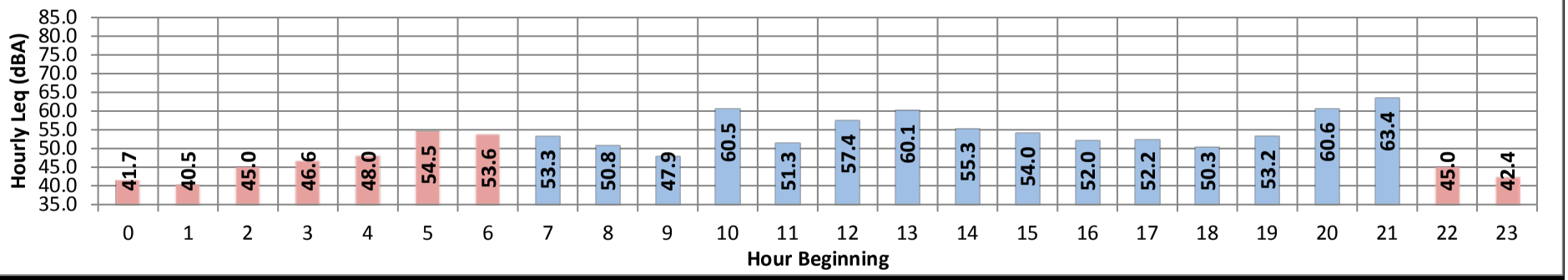
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	56.1	80.8	36.3	69.0	62.0	51.0	48.0	41.0	38.0	36.0	36.0	36.0
	Max	64.3	93.8	39.2	78.0	75.0	69.0	64.0	51.0	43.0	39.0	39.0	39.0
Energy Average:		61.2	Average:		73.5	68.4	59.9	55.6	45.5	40.4	37.1	37.0	37.0
Night	Min	48.8	75.4	36.3	51.0	48.0	43.0	40.0	38.0	36.0	36.0	36.0	36.0
	Max	62.3	85.7	40.9	77.0	73.0	63.0	57.0	50.0	45.0	42.0	42.0	41.0
Energy Average:		56.1	Average:		60.6	56.0	49.2	45.8	42.0	39.8	38.2	38.0	37.6
Hourly Summary													
Night	0	48.8	78.1	36.3	55.0	51.0	45.0	42.0	39.0	39.0	36.0	36.0	36.0
	1	52.2	83.7	36.3	51.0	48.0	43.0	40.0	38.0	36.0	36.0	36.0	36.0
	2	48.8	75.9	36.3	57.0	48.0	43.0	40.0	39.0	36.0	36.0	36.0	36.0
	3	54.6	83.6	36.3	62.0	55.0	49.0	43.0	40.0	39.0	36.0	36.0	36.0
	4	53.2	82.7	39.0	57.0	54.0	47.0	45.0	41.0	39.0	39.0	39.0	39.0
	5	60.0	84.6	39.3	74.0	69.0	57.0	54.0	47.0	43.0	41.0	40.0	39.0
	6	62.3	85.7	40.9	77.0	73.0	63.0	57.0	50.0	45.0	42.0	42.0	41.0
Day	7	60.9	85.0	38.5	75.0	70.0	60.0	54.0	47.0	42.0	39.0	39.0	39.0
	8	58.9	81.5	36.3	73.0	66.0	60.0	57.0	48.0	41.0	36.0	36.0	36.0
	9	56.1	81.2	36.3	69.0	62.0	54.0	52.0	44.0	39.0	36.0	36.0	36.0
	10	61.8	83.5	36.3	76.0	71.0	64.0	60.0	47.0	40.0	36.0	36.0	36.0
	11	59.3	80.8	36.3	73.0	70.0	62.0	57.0	45.0	39.0	36.0	36.0	36.0
	12	60.5	86.8	36.3	73.0	69.0	59.0	55.0	44.0	38.0	36.0	36.0	36.0
	13	64.3	85.5	36.3	78.0	75.0	69.0	64.0	51.0	43.0	36.0	36.0	36.0
	14	63.4	93.0	36.3	75.0	73.0	65.0	58.0	46.0	39.0	36.0	36.0	36.0
	15	62.6	82.6	36.3	76.0	74.0	68.0	63.0	49.0	41.0	36.0	36.0	36.0
	16	60.2	82.2	36.3	75.0	70.0	59.0	54.0	44.0	39.0	36.0	36.0	36.0
	17	61.4	86.1	38.4	75.0	71.0	63.0	58.0	45.0	42.0	39.0	39.0	39.0
	18	58.6	83.0	39.2	72.0	64.0	55.0	51.0	44.0	41.0	39.0	39.0	39.0
	19	57.5	83.9	39.2	70.0	63.0	55.0	53.0	46.0	42.0	39.0	39.0	39.0
	20	63.7	93.8	36.3	72.0	64.0	55.0	50.0	42.0	41.0	39.0	39.0	39.0
	21	60.8	90.3	36.3	71.0	64.0	51.0	48.0	41.0	39.0	38.0	36.0	36.0
Night	22	50.0	79.9	36.3	56.0	54.0	49.0	46.0	41.0	39.0	39.0	38.0	36.0
	23	49.8	75.4	38.4	56.0	52.0	47.0	45.0	43.0	42.0	39.0	39.0	39.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

				Energy Average Leq		24-Hour
Project Name:	Canterwood	*JN:*	11304	*Day*	*Night*	*CNEL*
Location:	L2 - Located west of the Project site off of Leon Road near existing residentialclose to Holland Road.	*Analyst:*	A. Wolfe	57.2	49.1	59.8
		Date:	2/21/2018			

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	47.9	69.8	34.8	61.0	56.0	49.0	46.0	39.0	37.0	35.0	35.0	35.0
	Max	63.4	91.6	37.8	73.0	69.0	63.0	60.0	48.0	42.0	39.0	38.0	37.0
Energy Average:		57.2	Average:		65.7	61.7	55.3	51.9	43.5	39.5	36.5	35.9	35.7
Night	Min	40.5	63.1	34.8	46.0	44.0	41.0	38.0	35.0	35.0	35.0	35.0	35.0
	Max	54.5	82.6	40.7	66.0	64.0	57.0	54.0	48.0	45.0	42.0	41.0	41.0
Energy Average:		49.1	Average:		54.4	51.6	46.4	44.0	40.2	38.7	37.1	36.8	36.6
Hourly Summary													
Night	0	41.7	67.7	34.8	51.0	46.0	41.0	40.0	37.0	35.0	35.0	35.0	35.0
	1	40.5	69.3	34.8	47.0	46.0	41.0	38.0	35.0	35.0	35.0	35.0	35.0
	2	45.0	75.6	34.8	46.0	44.0	41.0	39.0	37.0	35.0	35.0	35.0	35.0
	3	46.6	72.8	34.8	55.0	52.0	46.0	43.0	39.0	38.0	37.0	37.0	37.0
	4	48.0	77.4	37.7	54.0	51.0	47.0	45.0	41.0	40.0	37.0	37.0	37.0
	5	54.5	82.6	39.4	66.0	61.0	52.0	50.0	45.0	43.0	40.0	40.0	39.0
	6	53.6	76.8	40.7	66.0	64.0	57.0	54.0	48.0	45.0	42.0	41.0	41.0
Day	7	53.3	81.5	37.7	65.0	61.0	53.0	50.0	44.0	41.0	38.0	37.0	37.0
	8	50.8	73.0	34.8	62.0	60.0	56.0	53.0	48.0	42.0	37.0	35.0	35.0
	9	47.9	69.8	34.8	61.0	56.0	52.0	50.0	43.0	38.0	35.0	35.0	35.0
	10	60.5	87.1	34.8	69.0	64.0	59.0	55.0	44.0	39.0	35.0	35.0	35.0
	11	51.3	74.7	34.8	64.0	61.0	55.0	51.0	44.0	39.0	35.0	35.0	35.0
	12	57.4	85.8	34.8	67.0	62.0	56.0	52.0	42.0	37.0	35.0	35.0	35.0
	13	60.1	84.1	34.8	73.0	69.0	63.0	60.0	48.0	42.0	35.0	35.0	35.0
	14	55.3	81.7	34.8	66.0	63.0	58.0	53.0	44.0	39.0	36.0	35.0	35.0
	15	54.0	75.2	34.8	67.0	65.0	60.0	56.0	44.0	39.0	35.0	35.0	35.0
	16	52.0	79.1	34.8	65.0	61.0	53.0	50.0	43.0	39.0	37.0	37.0	35.0
	17	52.2	72.1	37.7	66.0	63.0	58.0	53.0	43.0	41.0	38.0	37.0	37.0
	18	50.3	77.2	37.8	62.0	58.0	52.0	50.0	42.0	40.0	39.0	38.0	37.0
	19	53.2	80.7	37.8	64.0	60.0	53.0	51.0	43.0	40.0	39.0	38.0	37.0
	20	60.6	91.6	37.4	65.0	60.0	52.0	48.0	41.0	39.0	37.0	37.0	37.0
	21	63.4	90.0	34.8	70.0	63.0	49.0	46.0	39.0	37.0	36.0	35.0	35.0
Night	22	45.0	71.8	34.8	55.0	51.0	47.0	43.0	39.0	38.0	36.0	35.0	35.0
	23	42.4	63.1	34.8	50.0	49.0	46.0	44.0	41.0	39.0	37.0	36.0	35.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name: Canterwood

Location: L3 - Located north of the Project site off of Holland Road.

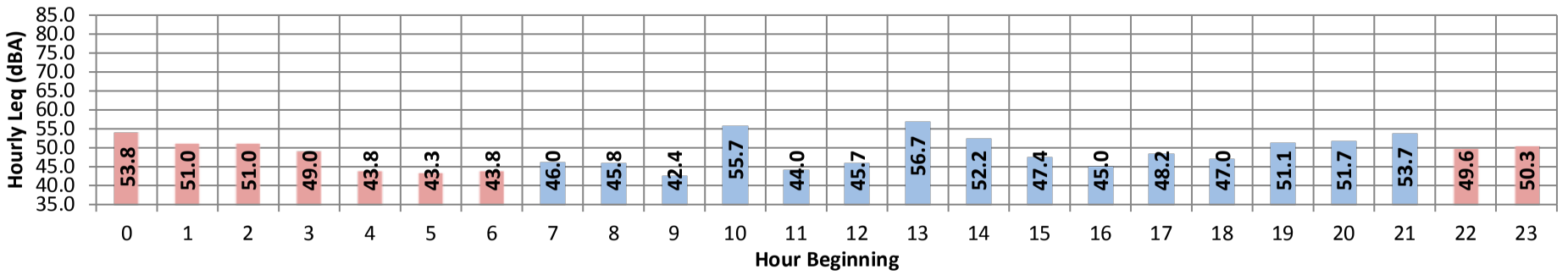
JN: 11304

Analyst: A. Wolfe

Date: 2/21/2018

Energy Average Leq		*24-Hour*
Day	*Night*	*CNEL*
51.0	49.7	56.8

Hourly Leq dBA Readings (unadjusted)



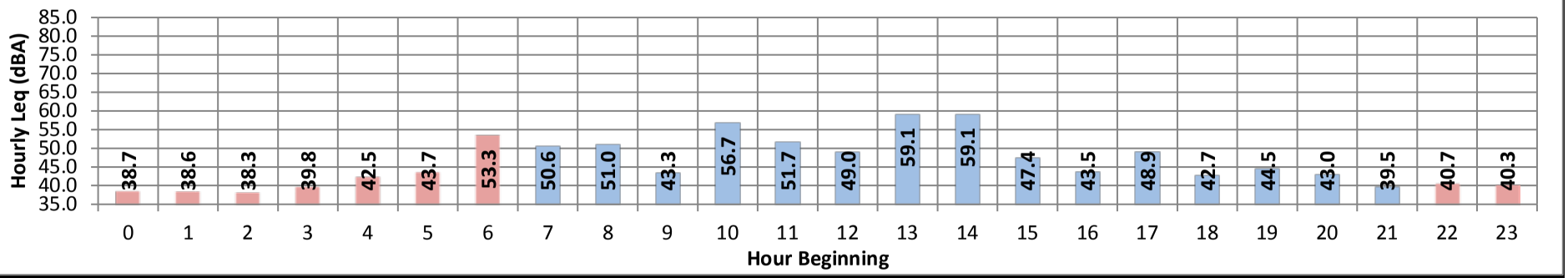
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	42.4	57.5	37.8	51.0	50.0	45.0	43.0	39.0	37.0	37.0	37.0	37.0
	Max	56.7	84.3	50.1	71.0	65.0	57.0	56.0	54.0	53.0	50.0	50.0	50.0
Energy Average:		51.0	Average:		57.9	54.9	50.7	48.6	43.9	41.3	39.8	39.8	39.7
Night	Min	43.3	52.7	37.8	49.0	47.0	45.0	45.0	42.0	41.0	40.0	40.0	40.0
	Max	53.8	60.1	50.7	58.0	58.0	57.0	56.0	54.0	52.0	51.0	51.0	51.0
Energy Average:		49.7	Average:		52.2	51.6	50.6	50.0	48.3	46.9	45.9	45.6	45.6
Hourly Summary													
Night	0	53.8	60.1	50.7	58.0	58.0	57.0	56.0	54.0	52.0	51.0	51.0	51.0
	1	51.0	54.0	48.8	53.0	52.0	52.0	52.0	51.0	50.0	49.0	49.0	49.0
	2	51.0	52.7	49.8	52.0	52.0	52.0	51.0	51.0	50.0	50.0	50.0	50.0
	3	49.0	56.2	45.3	51.0	51.0	51.0	51.0	50.0	48.0	46.0	45.0	45.0
	4	43.8	53.7	38.1	49.0	47.0	45.0	45.0	44.0	43.0	40.0	40.0	40.0
	5	43.3	54.6	40.5	50.0	49.0	47.0	46.0	42.0	41.0	40.0	40.0	40.0
	6	43.8	57.7	37.8	51.0	50.0	48.0	47.0	43.0	41.0	40.0	40.0	40.0
Day	7	46.0	64.1	37.8	57.0	55.0	51.0	49.0	44.0	40.0	37.0	37.0	37.0
	8	45.8	64.4	37.8	58.0	55.0	52.0	49.0	42.0	37.0	37.0	37.0	37.0
	9	42.4	61.2	37.8	53.0	51.0	47.0	45.0	40.0	37.0	37.0	37.0	37.0
	10	55.7	79.6	37.8	65.0	61.0	55.0	52.0	42.0	37.0	37.0	37.0	37.0
	11	44.0	66.0	37.8	55.0	52.0	48.0	46.0	40.0	37.0	37.0	37.0	37.0
	12	45.7	65.0	37.8	59.0	56.0	50.0	46.0	40.0	37.0	37.0	37.0	37.0
	13	56.7	77.8	37.8	71.0	65.0	57.0	51.0	43.0	40.0	37.0	37.0	37.0
	14	52.2	84.3	37.8	53.0	50.0	45.0	43.0	40.0	37.0	37.0	37.0	37.0
	15	47.4	69.6	37.8	59.0	54.0	48.0	45.0	40.0	37.0	37.0	37.0	37.0
	16	45.0	64.6	37.8	59.0	55.0	48.0	45.0	39.0	37.0	37.0	37.0	37.0
	17	48.2	68.5	37.8	60.0	55.0	48.0	48.0	46.0	44.0	37.0	37.0	37.0
	18	47.0	59.4	43.5	51.0	50.0	49.0	49.0	47.0	46.0	43.0	43.0	43.0
	19	51.1	57.5	46.6	54.0	53.0	53.0	53.0	51.0	50.0	48.0	48.0	47.0
	20	51.7	62.4	50.1	56.0	55.0	53.0	52.0	51.0	51.0	50.0	50.0	50.0
	21	53.7	59.4	49.0	58.0	57.0	56.0	56.0	54.0	53.0	49.0	49.0	49.0
Night	22	49.6	55.6	47.5	53.0	52.0	51.0	51.0	50.0	48.0	48.0	47.0	47.0
	23	50.3	54.6	48.2	53.0	53.0	52.0	51.0	50.0	49.0	49.0	48.0	48.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Canterwood	*JN:*	11304	*Energy Average Leq*	*24-Hour*
Location:	L4 - Located east of the Project site near the SEC of Eucalyptus Road and Holland Road.	*Analyst:*	A. Wolfe	*Day* / *Night*	*CNEL*
		Date:	2/21/2018	52.7 / 45.3	54.0

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	39.5	52.6	35.3	48.0	45.0	41.0	40.0	38.0	38.0	35.0	35.0	35.0
	Max	59.1	90.6	38.2	73.0	69.0	61.0	57.0	48.0	44.0	39.0	38.0	38.0
Energy Average:		52.7	Average:		60.1	56.3	51.3	48.7	42.6	39.5	36.9	36.6	36.3
Night	Min	38.3	47.6	35.3	44.0	42.0	40.0	38.0	38.0	38.0	35.0	35.0	35.0
	Max	53.3	73.4	39.7	69.0	62.0	54.0	52.0	45.0	42.0	40.0	40.0	40.0
Energy Average:		45.3	Average:		51.2	47.3	43.9	42.0	39.6	38.7	37.9	37.9	37.9
Hourly Summary													
Night	0	38.7	54.0	35.3	47.0	44.0	40.0	38.0	38.0	38.0	35.0	35.0	35.0
	1	38.6	53.0	37.9	47.0	42.0	40.0	38.0	38.0	38.0	38.0	38.0	38.0
	2	38.3	47.6	38.1	44.0	42.0	40.0	38.0	38.0	38.0	38.0	38.0	38.0
	3	39.8	55.4	38.2	50.0	43.0	40.0	40.0	38.0	38.0	38.0	38.0	38.0
	4	42.5	68.6	38.2	52.0	48.0	44.0	42.0	40.0	38.0	38.0	38.0	38.0
	5	43.7	56.6	38.2	52.0	51.0	50.0	48.0	42.0	40.0	38.0	38.0	38.0
	6	53.3	73.4	39.7	69.0	62.0	54.0	52.0	45.0	42.0	40.0	40.0	40.0
Day	7	50.6	72.5	36.5	63.0	59.0	53.0	50.0	43.0	40.0	38.0	38.0	38.0
	8	51.0	71.1	35.3	64.0	61.0	55.0	53.0	46.0	40.0	35.0	35.0	35.0
	9	43.3	59.8	35.3	55.0	52.0	48.0	45.0	41.0	38.0	35.0	35.0	35.0
	10	56.7	77.2	35.3	71.0	67.0	58.0	55.0	44.0	38.0	35.0	35.0	35.0
	11	51.7	76.1	35.3	64.0	59.0	55.0	52.0	44.0	39.0	35.0	35.0	35.0
	12	49.0	67.4	35.3	61.0	59.0	55.0	52.0	46.0	41.0	38.0	35.0	35.0
	13	59.1	83.4	35.3	73.0	69.0	61.0	57.0	48.0	44.0	38.0	38.0	35.0
	14	59.1	90.6	35.3	69.0	63.0	56.0	52.0	45.0	40.0	35.0	35.0	35.0
	15	47.4	66.5	35.3	61.0	57.0	53.0	50.0	42.0	38.0	35.0	35.0	35.0
	16	43.5	67.3	35.3	52.0	50.0	47.0	45.0	40.0	38.0	38.0	38.0	36.0
	17	48.9	70.4	38.2	64.0	56.0	47.0	44.0	41.0	40.0	38.0	38.0	38.0
	18	42.7	57.6	38.2	51.0	49.0	47.0	46.0	41.0	40.0	39.0	38.0	38.0
	19	44.5	64.0	38.2	55.0	53.0	51.0	48.0	41.0	40.0	38.0	38.0	38.0
	20	43.0	66.0	38.1	51.0	46.0	43.0	41.0	39.0	38.0	38.0	38.0	38.0
	21	39.5	52.6	38.0	48.0	45.0	41.0	40.0	38.0	38.0	38.0	38.0	38.0
Night	22	40.7	54.4	38.0	51.0	48.0	45.0	42.0	39.0	38.0	38.0	38.0	38.0
	23	40.3	64.1	38.0	49.0	46.0	42.0	40.0	38.0	38.0	38.0	38.0	38.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name: Canterwood

Location: L5 - Located east of the Project site off of Eucalyptus Road.

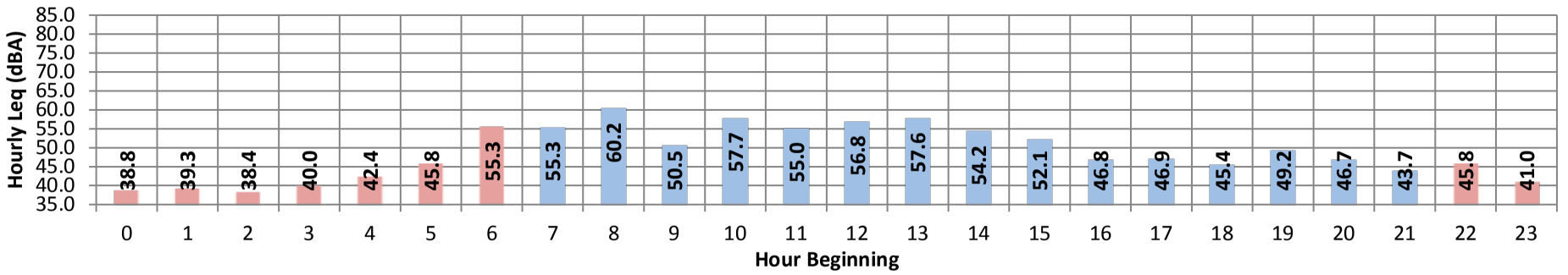
JN: 11304

Analyst: A. Wolfe

Date: 2/21/2018

Energy Average Leq		*24-Hour*
Day	*Night*	*CNEL*
54.4	47.3	55.9

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	43.7	59.0	35.1	51.0	50.0	46.0	44.0	41.0	38.0	35.0	35.0	35.0
	Max	60.2	88.6	39.5	74.0	68.0	61.0	56.0	47.0	45.0	43.0	42.0	41.0
Energy Average:		54.4	Average:		61.8	58.2	52.8	50.1	44.0	40.9	38.3	37.7	37.1
Night	Min	38.4	55.3	35.1	44.0	42.0	40.0	39.0	37.0	36.0	35.0	35.0	35.0
	Max	55.3	90.5	42.2	64.0	61.0	56.0	54.0	48.0	47.0	45.0	44.0	43.0
Energy Average:		47.3	Average:		51.6	48.6	45.2	44.0	41.2	40.1	38.0	37.7	37.3
Hourly Summary													
Night	0	38.8	58.2	35.1	48.0	44.0	40.0	39.0	37.0	36.0	35.0	35.0	35.0
	1	39.3	58.0	35.5	47.0	44.0	41.0	40.0	39.0	38.0	36.0	36.0	36.0
	2	38.4	55.3	35.4	44.0	42.0	41.0	40.0	38.0	37.0	36.0	36.0	36.0
	3	40.0	59.3	35.7	50.0	45.0	41.0	40.0	38.0	38.0	36.0	36.0	36.0
	4	42.4	63.4	36.3	52.0	49.0	44.0	43.0	41.0	40.0	38.0	37.0	37.0
	5	45.8	68.9	37.9	55.0	53.0	51.0	49.0	44.0	42.0	40.0	39.0	39.0
	6	55.3	90.5	42.2	64.0	61.0	56.0	54.0	48.0	47.0	45.0	44.0	43.0
Day	7	55.3	85.1	39.5	65.0	59.0	52.0	50.0	46.0	45.0	43.0	42.0	41.0
	8	60.2	85.8	35.1	74.0	66.0	57.0	53.0	45.0	40.0	36.0	36.0	35.0
	9	50.5	79.3	35.1	60.0	56.0	51.0	49.0	42.0	39.0	36.0	35.0	35.0
	10	57.7	82.6	35.1	72.0	67.0	59.0	54.0	44.0	39.0	36.0	35.0	35.0
	11	55.0	84.6	35.1	64.0	60.0	54.0	50.0	43.0	39.0	36.0	35.0	35.0
	12	56.8	88.6	35.1	67.0	63.0	56.0	51.0	42.0	38.0	35.0	35.0	35.0
	13	57.6	85.1	35.1	71.0	68.0	61.0	56.0	46.0	41.0	36.0	36.0	35.0
	14	54.2	86.4	36.8	61.0	58.0	55.0	54.0	45.0	41.0	40.0	39.0	38.0
	15	52.1	79.1	37.2	62.0	59.0	55.0	53.0	45.0	41.0	39.0	38.0	38.0
	16	46.8	77.2	36.1	53.0	50.0	47.0	46.0	42.0	40.0	38.0	38.0	37.0
	17	46.9	69.9	37.2	60.0	56.0	46.0	44.0	41.0	40.0	39.0	38.0	38.0
	18	45.4	64.8	38.0	55.0	53.0	50.0	47.0	44.0	42.0	40.0	40.0	39.0
	19	49.2	73.7	37.8	59.0	57.0	53.0	51.0	47.0	44.0	41.0	40.0	39.0
	20	46.7	67.2	37.2	53.0	51.0	49.0	48.0	45.0	43.0	40.0	39.0	38.0
	21	43.7	59.0	36.7	51.0	50.0	47.0	46.0	43.0	42.0	39.0	39.0	38.0
Night	22	45.8	63.0	37.4	54.0	52.0	49.0	48.0	46.0	44.0	39.0	39.0	38.0
	23	41.0	57.0	35.6	50.0	47.0	44.0	43.0	40.0	39.0	37.0	37.0	36.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name: Canterwood

Location: L6 - Located south of the Project site off of Craig Avenue.

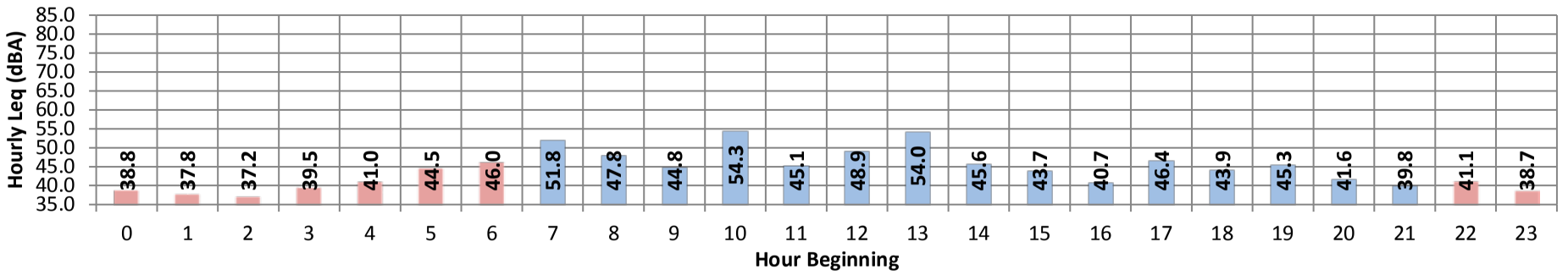
JN: 11304

Analyst: A. Wolfe

Date: 2/21/2018

Energy Average Leq		*24-Hour*
Day	*Night*	*CNEL*
48.5	41.6	50.1

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	39.8	56.1	36.1	50.0	47.0	43.0	40.0	38.0	36.0	36.0	36.0	36.0
	Max	54.3	77.2	38.7	67.0	62.0	57.0	53.0	45.0	40.0	39.0	39.0	39.0
Energy Average:		48.5	Average:		57.5	54.5	49.8	47.3	41.4	37.8	36.4	36.3	36.2
Night	Min	37.2	50.9	36.1	45.0	42.0	39.0	38.0	36.0	36.0	36.0	36.0	36.0
	Max	46.0	60.6	37.5	55.0	54.0	52.0	51.0	45.0	41.0	39.0	39.0	39.0
Energy Average:		41.6	Average:		50.7	47.2	43.7	41.8	38.6	37.1	36.3	36.3	36.3
Hourly Summary													
Night	0	38.8	56.8	36.1	49.0	46.0	40.0	39.0	36.0	36.0	36.0	36.0	36.0
	1	37.8	53.2	36.1	48.0	44.0	40.0	38.0	36.0	36.0	36.0	36.0	36.0
	2	37.2	50.9	36.1	45.0	42.0	39.0	38.0	36.0	36.0	36.0	36.0	36.0
	3	39.5	55.1	36.1	52.0	44.0	40.0	39.0	37.0	36.0	36.0	36.0	36.0
	4	41.0	59.6	36.1	51.0	47.0	44.0	42.0	39.0	38.0	36.0	36.0	36.0
	5	44.5	58.9	36.1	54.0	53.0	51.0	49.0	42.0	39.0	36.0	36.0	36.0
	6	46.0	60.6	37.5	55.0	54.0	52.0	51.0	45.0	41.0	39.0	39.0	39.0
Day	7	51.8	72.9	36.1	65.0	62.0	57.0	53.0	45.0	39.0	36.0	36.0	36.0
	8	47.8	66.1	36.1	59.0	57.0	54.0	52.0	45.0	39.0	36.0	36.0	36.0
	9	44.8	63.4	36.1	57.0	55.0	50.0	47.0	41.0	38.0	36.0	36.0	36.0
	10	54.3	77.2	36.1	66.0	61.0	55.0	52.0	42.0	37.0	36.0	36.0	36.0
	11	45.1	63.9	36.1	56.0	54.0	52.0	48.0	41.0	36.0	36.0	36.0	36.0
	12	48.9	73.0	36.1	60.0	57.0	50.0	47.0	40.0	36.0	36.0	36.0	36.0
	13	54.0	76.4	36.1	67.0	62.0	54.0	51.0	44.0	39.0	36.0	36.0	36.0
	14	45.6	66.6	36.1	57.0	52.0	47.0	46.0	40.0	36.0	36.0	36.0	36.0
	15	43.7	63.6	36.1	55.0	53.0	49.0	47.0	41.0	37.0	36.0	36.0	36.0
	16	40.7	58.3	36.1	50.0	48.0	45.0	43.0	39.0	36.0	36.0	36.0	36.0
	17	46.4	67.0	36.1	59.0	56.0	46.0	44.0	42.0	40.0	36.0	36.0	36.0
	18	43.9	59.5	38.7	54.0	51.0	49.0	47.0	42.0	40.0	39.0	39.0	39.0
	19	45.3	59.9	36.1	56.0	54.0	52.0	50.0	42.0	39.0	39.0	38.0	36.0
	20	41.6	61.9	36.1	52.0	47.0	43.0	42.0	39.0	39.0	36.0	36.0	36.0
	21	39.8	56.1	36.1	50.0	48.0	44.0	40.0	38.0	36.0	36.0	36.0	36.0
Night	22	41.1	57.3	36.1	53.0	50.0	46.0	41.0	39.0	36.0	36.0	36.0	36.0
	23	38.7	52.8	36.1	49.0	45.0	41.0	39.0	37.0	36.0	36.0	36.0	36.0

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: Haun Rd.
Road Segment: n/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	670	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-4.15	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-21.39	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-25.34	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	62.2	60.9	54.9	63.3	63.9
Medium Trucks:	57.8	53.9	46.4	55.2	61.3	61.4
Heavy Trucks:	58.2	54.2	50.8	55.4	61.6	61.7
Vehicle Noise:	65.9	63.4	61.5	59.9	67.0	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	80	172	370
CNEL:	39	84	180	389

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Zeiders Rd.
Road Segment: s/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	120	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-11.62	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-28.86	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-32.81	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.8	54.8	53.4	47.4	55.9	56.5
Medium Trucks:	50.3	46.4	38.9	47.7	53.9	53.9
Heavy Trucks:	50.8	46.7	43.3	48.0	54.2	54.3
Vehicle Noise:	58.5	55.9	54.0	52.5	59.5	59.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	25	55	118
CNEL:	12	27	57	123

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Antelope Rd.
Road Segment: s/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,060	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.16	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-19.39	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-23.35	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.2	62.9	56.9	65.3	65.9
Medium Trucks:	59.8	55.9	48.4	57.2	63.3	63.4
Heavy Trucks:	60.2	56.2	52.8	57.4	63.6	63.7
Vehicle Noise:	67.9	65.4	63.4	61.9	69.0	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	108	233	502
CNEL:	53	114	245	528

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Menifee Rd.
Road Segment: n/o Holland Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	600	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	64.0	feet
Centerline Dist. to Observer:	64.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.17	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-21.41	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.36	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.0	60.0	58.7	52.7	61.1	61.7
Medium Trucks:	55.8	51.9	44.4	53.1	59.3	59.3
Heavy Trucks:	56.6	52.6	49.2	53.8	60.0	60.1
Vehicle Noise:	63.8	61.2	59.3	58.0	65.0	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	64	137	295
CNEL:	31	67	144	309

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Menifee Rd.
Road Segment: s/o Holland Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	530 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.71	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-21.95	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.90	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.5	59.4	58.1	52.1	60.5	61.2
Medium Trucks:	55.2	51.3	43.8	52.6	58.7	58.8
Heavy Trucks:	56.1	52.0	48.6	53.3	59.5	59.6
Vehicle Noise:	63.3	60.7	58.7	57.5	64.4	64.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	59	126	272
CNEL:	28	61	132	285

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Leon Rd.
Road Segment: s/o Craig Av.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	40 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-15.09	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-29.95	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-27.74	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.4	45.5	44.1	38.1	46.5	47.1
Medium Trucks:	44.0	40.0	32.2	41.4	47.6	47.6
Heavy Trucks:	52.0	48.0	40.3	49.5	55.6	55.7
Vehicle Noise:	53.8	50.4	45.8	50.4	56.7	56.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	17	36	77
CNEL:	8	17	36	78

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Leon Rd.
Road Segment: s/o Garbani Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	70 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-14.62	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-29.49	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-27.27	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.3	53.4	52.0	46.0	54.5	55.1
Medium Trucks:	51.1	47.1	39.4	48.6	54.7	54.8
Heavy Trucks:	57.3	53.3	45.6	54.8	60.9	61.0
Vehicle Noise:	60.0	56.9	53.1	56.1	62.6	62.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	88	189
CNEL:	19	42	90	193

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Leon Rd.
Road Segment: s/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	270 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.76	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-23.62	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.41	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.2	59.3	57.9	51.9	60.3	61.0
Medium Trucks:	57.0	53.0	45.2	54.4	60.6	60.6
Heavy Trucks:	63.2	59.2	51.4	60.6	66.8	66.8
Vehicle Noise:	65.9	62.8	59.0	62.0	68.4	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	100	216	465
CNEL:	47	102	220	474

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.04	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-24.28	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-28.23	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.6	57.6	56.3	50.3	58.7	59.3
Medium Trucks:	53.4	49.5	42.0	50.7	56.9	56.9
Heavy Trucks:	54.2	50.2	46.8	51.4	57.6	57.7
Vehicle Noise:	61.4	58.8	56.9	55.6	62.6	62.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	88	189
CNEL:	20	43	92	198

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: e/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	290 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.33	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-24.57	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-28.52	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.3	57.3	56.0	50.0	58.4	59.0
Medium Trucks:	53.1	49.2	41.7	50.4	56.6	56.6
Heavy Trucks:	53.9	49.9	46.5	51.1	57.3	57.4
Vehicle Noise:	61.2	58.6	56.6	55.3	62.3	62.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	84	180
CNEL:	19	41	88	189

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	30 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-17.18	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-34.42	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-38.37	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.5	47.5	46.1	40.1	48.5	49.2
Medium Trucks:	43.2	39.3	31.8	40.6	46.8	46.8
Heavy Trucks:	44.1	40.0	36.6	41.3	47.5	47.6
Vehicle Noise:	51.3	48.7	46.7	45.5	52.4	52.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	9	18	40
CNEL:	4	9	19	42

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	20 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-19.19	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-34.06	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-31.84	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.5	45.6	44.1	38.1	46.6	47.2
Medium Trucks:	43.6	39.6	31.8	41.0	47.2	47.2
Heavy Trucks:	50.6	46.6	38.9	48.1	54.2	54.2
Vehicle Noise:	52.9	49.6	45.5	49.2	55.6	55.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	14	30	65
CNEL:	7	14	30	66

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,060	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.16	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-19.39	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-23.35	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.0	63.0	61.7	55.7	64.1	64.7
Medium Trucks:	58.6	54.7	47.2	55.9	62.1	62.1
Heavy Trucks:	59.0	54.9	51.5	56.2	62.4	62.5
Vehicle Noise:	66.7	64.1	62.2	60.7	67.7	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	115	248	535
CNEL:	56	121	261	562

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,550	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.51	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-17.74	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-21.70	-1.84	-1.20	-5.25	0.000	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	64.6	63.3	57.3	65.7	66.4
Medium Trucks:	60.2	56.3	48.8	57.6	63.7	63.8
Heavy Trucks:	60.6	56.6	53.2	57.8	64.0	64.1
Vehicle Noise:	68.3	65.8	63.9	62.3	69.4	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	149	320	690
CNEL:	72	156	336	724

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,400	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.36	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-18.60	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.56	-1.84	-1.20	-5.25	0.000	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	64.0	58.0	66.5	67.1
Medium Trucks:	60.8	56.9	49.4	58.1	64.3	64.3
Heavy Trucks:	60.8	56.8	53.4	58.0	64.2	64.3
Vehicle Noise:	68.9	66.4	64.5	62.8	69.9	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	75	161	346	746
CNEL:	79	169	364	785

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,170	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.14	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-19.38	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-23.33	-1.84	-1.20	-5.25	0.000	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	64.6	63.3	57.3	65.7	66.3
Medium Trucks:	60.0	56.1	48.6	57.3	63.5	63.5
Heavy Trucks:	60.0	56.0	52.6	57.2	63.4	63.5
Vehicle Noise:	68.2	65.6	63.8	62.0	69.1	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	66	143	307	662
CNEL:	70	150	323	697

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Scott Rd.
Road Segment: w/o Leon Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,130	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.29	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-19.53	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-23.49	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.4	63.1	57.1	65.5	66.1
Medium Trucks:	59.8	55.9	48.4	57.2	63.4	63.4
Heavy Trucks:	59.9	55.8	52.4	57.1	63.3	63.4
Vehicle Noise:	68.0	65.5	63.6	61.9	69.0	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	65	139	300	647
CNEL:	68	147	316	681

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Scott Rd.
Road Segment: e/o Leon Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	510	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-6.00	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-20.86	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.64	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.7	60.8	59.4	53.4	61.9	62.5
Medium Trucks:	58.5	54.5	46.7	55.9	62.1	62.1
Heavy Trucks:	64.7	60.7	52.9	62.2	68.3	68.3
Vehicle Noise:	67.4	64.3	60.5	63.5	70.0	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	163	351	757
CNEL:	77	166	358	772

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021
Road Name: Haun Rd.
Road Segment: n/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	690	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-4.02	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-21.26	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-25.21	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.4	62.4	61.0	55.0	63.4	64.1
Medium Trucks:	57.9	54.0	46.5	55.3	61.5	61.5
Heavy Trucks:	58.4	54.3	50.9	55.6	61.8	61.9
Vehicle Noise:	66.1	63.5	61.6	60.1	67.1	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	38	81	175	377
CNEL:	40	85	184	396

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021
Road Name: Zeiders Rd.
Road Segment: s/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	130	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-11.27	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-28.51	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-32.46	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.1	55.1	53.8	47.8	56.2	56.8
Medium Trucks:	50.7	46.8	39.3	48.0	54.2	54.3
Heavy Trucks:	51.1	47.1	43.7	48.3	54.5	54.6
Vehicle Noise:	58.8	56.3	54.3	52.8	59.8	60.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	27	58	124
CNEL:	13	28	60	130

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Antelope Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,080 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.07	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-19.31	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-23.27	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.3	63.0	57.0	65.4	66.0
Medium Trucks:	59.9	56.0	48.5	57.2	63.4	63.4
Heavy Trucks:	60.3	56.3	52.9	57.5	63.7	63.8
Vehicle Noise:	68.0	65.5	63.5	62.0	69.0	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	51	110	236	509
CNEL:	53	115	248	534

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: n/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	620 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.03	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-21.27	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.22	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.1	60.1	58.8	52.8	61.2	61.8
Medium Trucks:	55.9	52.0	44.5	53.3	59.4	59.5
Heavy Trucks:	56.7	52.7	49.3	54.0	60.2	60.3
Vehicle Noise:	64.0	61.4	59.4	58.1	65.1	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	65	140	302
CNEL:	32	68	147	316

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: s/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	540 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.63	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-21.87	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.82	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.5	59.5	58.2	52.2	60.6	61.2
Medium Trucks:	55.3	51.4	43.9	52.7	58.8	58.9
Heavy Trucks:	56.1	52.1	48.7	53.4	59.6	59.7
Vehicle Noise:	63.4	60.8	58.8	57.5	64.5	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	59	128	275
CNEL:	29	62	134	288

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Craig Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	290 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.48	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-21.35	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-19.13	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.0	54.1	52.7	46.7	55.1	55.8
Medium Trucks:	52.6	48.6	40.8	50.0	56.2	56.2
Heavy Trucks:	60.6	56.7	48.9	58.1	64.2	64.3
Vehicle Noise:	62.4	59.0	54.4	59.0	65.3	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	62	133	287
CNEL:	29	63	135	291

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Garbani Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	320	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.02	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-22.89	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.67	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.9	60.0	58.6	52.6	61.1	61.7
Medium Trucks:	57.7	53.7	46.0	55.2	61.3	61.4
Heavy Trucks:	63.9	59.9	52.2	61.4	67.5	67.6
Vehicle Noise:	66.7	63.5	59.7	62.7	69.2	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	112	242	521
CNEL:	53	114	247	531

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	300	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.30	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-23.17	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.95	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.7	59.8	58.4	52.3	60.8	61.4
Medium Trucks:	57.4	53.5	45.7	54.9	61.0	61.1
Heavy Trucks:	63.6	59.7	51.9	61.1	67.2	67.3
Vehicle Noise:	66.4	63.2	59.4	62.5	68.9	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	107	232	499
CNEL:	51	110	236	509

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	310	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.04	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-24.28	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-28.23	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.6	57.6	56.3	50.3	58.7	59.3
Medium Trucks:	53.4	49.5	42.0	50.7	56.9	56.9
Heavy Trucks:	54.2	50.2	46.8	51.4	57.6	57.7
Vehicle Noise:	61.4	58.8	56.9	55.6	62.6	62.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	88	189
CNEL:	20	43	92	198

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: e/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	330	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.77	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-24.00	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-27.96	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.9	57.9	56.6	50.5	59.0	59.6
Medium Trucks:	53.6	49.7	42.2	51.0	57.2	57.2
Heavy Trucks:	54.5	50.4	47.1	51.7	57.9	58.0
Vehicle Noise:	61.7	59.1	57.2	55.9	62.8	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	42	91	197
CNEL:	21	44	96	206

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	80	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-12.92	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-30.16	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-34.11	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.7	51.7	50.4	44.4	52.8	53.4
Medium Trucks:	47.5	43.6	36.1	44.8	51.0	51.1
Heavy Trucks:	48.3	44.3	40.9	45.5	51.7	51.8
Vehicle Noise:	55.6	53.0	51.0	49.7	56.7	57.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	16	35	76
CNEL:	8	17	37	80

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	70	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-13.75	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-28.62	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-26.40	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.9	51.0	49.6	43.6	52.0	52.6
Medium Trucks:	49.0	45.1	37.3	46.5	52.6	52.7
Heavy Trucks:	56.1	52.1	44.3	53.5	59.7	59.7
Vehicle Noise:	58.3	55.0	50.9	54.6	61.0	61.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	32	69	149
CNEL:	15	33	70	151

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,080	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.07	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-19.31	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-23.27	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.1	63.1	61.8	55.7	64.2	64.8
Medium Trucks:	58.6	54.7	47.2	56.0	62.2	62.2
Heavy Trucks:	59.1	55.0	51.6	56.3	62.5	62.6
Vehicle Noise:	66.8	64.2	62.3	60.8	67.8	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	117	252	542
CNEL:	57	123	264	569

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,600	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.37	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-17.61	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-21.56	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.8	64.8	63.5	57.4	65.9	66.5
Medium Trucks:	60.4	56.5	49.0	57.7	63.9	63.9
Heavy Trucks:	60.8	56.7	53.3	58.0	64.2	64.3
Vehicle Noise:	68.5	65.9	64.0	62.5	69.5	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	70	152	327	704
CNEL:	74	159	343	740

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	16,100 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,610 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	55 mph		
Near/Far Lane Distance:	78 feet		

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 65.422 | Medium Trucks: 65.286 | Heavy Trucks: 65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.75	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-17.99	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.95	-1.84	-1.20	-5.25	0.000	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	64.6	58.6	67.1	67.7
Medium Trucks:	61.4	57.5	50.0	58.7	64.9	64.9
Heavy Trucks:	61.4	57.4	54.0	58.6	64.8	64.9
Vehicle Noise:	69.6	67.0	65.1	63.4	70.5	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	82	176	380	819
CNEL:	86	186	400	862

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	13,800 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,380 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	55 mph		
Near/Far Lane Distance:	78 feet		

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 65.422 | Medium Trucks: 65.286 | Heavy Trucks: 65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.42	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-18.66	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.62	-1.84	-1.20	-5.25	0.000	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	65.3	64.0	58.0	66.4	67.0
Medium Trucks:	60.7	56.8	49.3	58.1	64.2	64.3
Heavy Trucks:	60.7	56.7	53.3	57.9	64.1	64.2
Vehicle Noise:	68.9	66.4	64.5	62.8	69.8	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	74	159	343	739
CNEL:	78	168	361	778

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	13,300 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,330 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	55 mph		
Near/Far Lane Distance:	78 feet		

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 65.422 | Medium Trucks: 65.286 | Heavy Trucks: 65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.58	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-18.82	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.78	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.1	63.8	57.8	66.2	66.9
Medium Trucks:	60.5	56.6	49.1	57.9	64.1	64.1
Heavy Trucks:	60.6	56.5	53.1	57.8	64.0	64.1
Vehicle Noise:	68.7	66.2	64.3	62.6	69.7	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	155	335	721
CNEL:	76	163	352	759

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Leon Rd.

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	5,400 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	540 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	55 mph		
Near/Far Lane Distance:	78 feet		

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 65.422 | Medium Trucks: 65.286 | Heavy Trucks: 65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.75	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-20.61	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.40	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.0	61.1	59.7	53.6	62.1	62.7
Medium Trucks:	58.7	54.8	47.0	56.2	62.4	62.4
Heavy Trucks:	65.0	61.0	53.2	62.4	68.6	68.6
Vehicle Noise:	67.7	64.5	60.7	63.8	70.2	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	79	169	365	786
CNEL:	80	173	372	802

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Haun Rd. | Job Number: 11304
Road Segment: n/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	710	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.90	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-21.13	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-25.09	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.5	62.5	61.2	55.2	63.6	64.2
Medium Trucks:	58.1	54.2	46.7	55.4	61.6	61.6
Heavy Trucks:	58.5	54.4	51.0	55.7	61.9	62.0
Vehicle Noise:	66.2	63.6	61.7	60.2	67.2	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	38	83	179	385
CNEL:	40	87	187	404

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Zeiders Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	130	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-11.27	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-28.51	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-32.46	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.1	55.1	53.8	47.8	56.2	56.8
Medium Trucks:	50.7	46.8	39.3	48.0	54.2	54.3
Heavy Trucks:	51.1	47.1	43.7	48.3	54.5	54.6
Vehicle Noise:	58.8	56.3	54.3	52.8	59.8	60.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	27	58	124
CNEL:	13	28	60	130

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Antelope Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,100	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.99	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-19.23	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-23.19	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.4	63.1	57.1	65.5	66.1
Medium Trucks:	60.0	56.1	48.6	57.3	63.5	63.5
Heavy Trucks:	60.4	56.3	52.9	57.6	63.8	63.9
Vehicle Noise:	68.1	65.5	63.6	62.1	69.1	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	111	239	515
CNEL:	54	117	251	541

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: n/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	640	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	64.0	feet
Centerline Dist. to Observer:	64.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.89	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-21.13	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.08	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.3	60.3	59.0	52.9	61.4	62.0
Medium Trucks:	56.0	52.1	44.6	53.4	59.6	59.6
Heavy Trucks:	56.9	52.8	49.4	54.1	60.3	60.4
Vehicle Noise:	64.1	61.5	59.6	58.3	65.2	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	66	143	308
CNEL:	32	70	150	323

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: s/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	550	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	64.0	feet
Centerline Dist. to Observer:	64.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.55	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-21.79	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.74	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.6	59.6	58.3	52.3	60.7	61.3
Medium Trucks:	55.4	51.5	44.0	52.7	58.9	58.9
Heavy Trucks:	56.2	52.2	48.8	53.4	59.6	59.7
Vehicle Noise:	63.5	60.9	58.9	57.6	64.6	64.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	60	129	279
CNEL:	29	63	136	292

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Craig Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	500	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-4.12	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-18.99	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-16.77	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.4	56.5	55.1	49.0	57.5	58.1
Medium Trucks:	55.0	51.0	43.2	52.4	58.6	58.6
Heavy Trucks:	63.0	59.0	51.2	60.4	66.6	66.6
Vehicle Noise:	64.8	61.4	56.8	61.3	67.7	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	89	192	413
CNEL:	42	90	194	419

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Garbani Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	530	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.83	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-20.70	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.48	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.1	62.2	60.8	54.8	63.3	63.9
Medium Trucks:	59.9	55.9	48.1	57.4	63.5	63.5
Heavy Trucks:	66.1	62.1	54.4	63.6	69.7	69.8
Vehicle Noise:	68.8	65.7	61.9	64.9	71.4	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	157	338	729
CNEL:	74	160	345	744

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	320	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.02	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-22.89	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.67	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.9	60.0	58.6	52.6	61.1	61.7
Medium Trucks:	57.7	53.7	46.0	55.2	61.3	61.4
Heavy Trucks:	63.9	59.9	52.2	61.4	67.5	67.6
Vehicle Noise:	66.7	63.5	59.7	62.7	69.2	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	112	242	521
CNEL:	53	114	247	531

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Holland Rd.
Road Segment: w/o Menifee Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	320	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.90	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-24.14	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-28.09	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.7	57.7	56.4	50.4	58.8	59.5
Medium Trucks:	53.5	49.6	42.1	50.9	57.0	57.1
Heavy Trucks:	54.4	50.3	46.9	51.6	57.8	57.9
Vehicle Noise:	61.6	59.0	57.0	55.7	62.7	63.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	42	89	193
CNEL:	20	43	94	202

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Holland Rd.
Road Segment: e/o Menifee Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	370	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.27	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-23.51	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-27.46	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.4	58.4	57.0	51.0	59.5	60.1
Medium Trucks:	54.1	50.2	42.7	51.5	57.7	57.7
Heavy Trucks:	55.0	50.9	47.5	52.2	58.4	58.5
Vehicle Noise:	62.2	59.6	57.7	56.4	63.3	63.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	46	98	212
CNEL:	22	48	103	222

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Holland Rd.
Road Segment: w/o Briggs Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	120	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-11.16	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-28.40	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-32.35	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.5	53.5	52.2	46.1	54.6	55.2
Medium Trucks:	49.3	45.4	37.9	46.6	52.8	52.8
Heavy Trucks:	50.1	46.1	42.7	47.3	53.5	53.6
Vehicle Noise:	57.3	54.7	52.8	51.5	58.4	58.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	10	22	46	100
CNEL:	10	23	49	105

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Holland Rd.
Road Segment: w/o Leon Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	110	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-11.79	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-26.65	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-24.43	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.9	53.0	51.5	45.5	54.0	54.6
Medium Trucks:	51.0	47.0	39.2	48.4	54.6	54.6
Heavy Trucks:	58.0	54.0	46.3	55.5	61.6	61.7
Vehicle Noise:	60.3	57.0	52.9	56.6	63.0	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	93	201
CNEL:	20	44	95	205

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Scott Rd.
Road Segment: w/o Haun Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,100	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.99	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-19.23	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-23.19	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.2	63.1	61.8	55.8	64.2	64.9
Medium Trucks:	58.7	54.8	47.3	56.1	62.2	62.3
Heavy Trucks:	59.1	55.1	51.7	56.4	62.6	62.6
Vehicle Noise:	66.9	64.3	62.4	60.9	67.9	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	255	549
CNEL:	58	124	267	576

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Scott Rd.
Road Segment: e/o Haun Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,650	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.23	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-17.47	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-21.43	-1.84	-1.20	-5.25	0.000	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	64.9	63.6	57.6	66.0	66.6
Medium Trucks:	60.5	56.6	49.1	57.8	64.0	64.0
Heavy Trucks:	60.9	56.9	53.5	58.1	64.3	64.4
Vehicle Noise:	68.6	66.1	64.1	62.6	69.6	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	155	334	719
CNEL:	75	163	350	755

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Scott Rd.
Road Segment: w/o Menifee Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,770	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.34	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-17.58	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.54	-1.84	-1.20	-5.25	0.000	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	65.1	59.0	67.5	68.1
Medium Trucks:	61.8	57.9	50.4	59.1	65.3	65.3
Heavy Trucks:	61.8	57.8	54.4	59.0	65.2	65.3
Vehicle Noise:	70.0	67.4	65.6	63.8	70.9	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	87	188	405	873
CNEL:	92	198	426	918

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Scott Rd.
Road Segment: w/o Briggs Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,550	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.92	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-18.16	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.11	-1.84	-1.20	-5.25	0.000	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	64.5	58.5	66.9	67.5
Medium Trucks:	61.2	57.3	49.8	58.6	64.7	64.8
Heavy Trucks:	61.2	57.2	53.8	58.4	64.6	64.7
Vehicle Noise:	69.4	66.9	65.0	63.3	70.3	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	80	172	371	799
CNEL:	84	181	390	840

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,500	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.06	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-18.30	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.26	-1.84	-1.20	-5.25	0.000	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	65.7	64.3	58.3	66.7	67.4
Medium Trucks:	61.1	57.2	49.7	58.4	64.6	64.6
Heavy Trucks:	61.1	57.1	53.7	58.3	64.5	64.6
Vehicle Noise:	69.2	66.7	64.8	63.1	70.2	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	78	168	363	781
CNEL:	82	177	382	822

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	550	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.67	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-20.53	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.32	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.1	61.2	59.7	53.7	62.2	62.8
Medium Trucks:	58.8	54.8	47.1	56.3	62.4	62.5
Heavy Trucks:	65.0	61.1	53.3	62.5	68.6	68.7
Vehicle Noise:	67.8	64.6	60.8	63.9	70.3	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	80	171	369	796
CNEL:	81	175	377	812

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Haun Rd. | Job Number: 11304
Road Segment: n/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	710	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.90	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-21.13	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-25.09	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.5	62.5	61.2	55.2	63.6	64.2
Medium Trucks:	58.1	54.2	46.7	55.4	61.6	61.6
Heavy Trucks:	58.5	54.4	51.0	55.7	61.9	62.0
Vehicle Noise:	66.2	63.6	61.7	60.2	67.2	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	38	83	179	385
CNEL:	40	87	187	404

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Zeiders Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	130	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-11.27	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-28.51	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-32.46	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.1	55.1	53.8	47.8	56.2	56.8
Medium Trucks:	50.7	46.8	39.3	48.0	54.2	54.3
Heavy Trucks:	51.1	47.1	43.7	48.3	54.5	54.6
Vehicle Noise:	58.8	56.3	54.3	52.8	59.8	60.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	27	58	124
CNEL:	13	28	60	130

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Antelope Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,130 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.88	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-19.12	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-23.07	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.5	64.5	63.2	57.2	65.6	66.2
Medium Trucks:	60.1	56.2	48.7	57.4	63.6	63.6
Heavy Trucks:	60.5	56.5	53.1	57.7	63.9	64.0
Vehicle Noise:	68.2	65.7	63.7	62.2	69.2	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	113	243	524
CNEL:	55	119	256	551

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: n/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	640 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.89	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-21.13	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.08	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.3	60.3	59.0	52.9	61.4	62.0
Medium Trucks:	56.0	52.1	44.6	53.4	59.6	59.6
Heavy Trucks:	56.9	52.8	49.4	54.1	60.3	60.4
Vehicle Noise:	64.1	61.5	59.6	58.3	65.2	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	66	143	308
CNEL:	32	70	150	323

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: s/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	570 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.39	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-21.63	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.59	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.8	59.8	58.4	52.4	60.9	61.5
Medium Trucks:	55.5	51.6	44.1	52.9	59.1	59.1
Heavy Trucks:	56.4	52.3	48.9	53.6	59.8	59.9
Vehicle Noise:	63.6	61.0	59.1	57.8	64.7	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	61	132	285
CNEL:	30	64	139	299

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Craig Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	40 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-15.09	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-29.95	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-27.74	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.4	45.5	44.1	38.1	46.5	47.1
Medium Trucks:	44.0	40.0	32.2	41.4	47.6	47.6
Heavy Trucks:	52.0	48.0	40.3	49.5	55.6	55.7
Vehicle Noise:	53.8	50.4	45.8	50.4	56.7	56.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	17	36	77
CNEL:	8	17	36	78

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Garbani Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	80 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-14.04	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-28.91	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-26.69	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.9	54.0	52.6	46.6	55.1	55.7
Medium Trucks:	51.7	47.7	39.9	49.1	55.3	55.3
Heavy Trucks:	57.9	53.9	46.1	55.4	61.5	61.5
Vehicle Noise:	60.6	57.5	53.7	56.7	63.2	63.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	45	96	207
CNEL:	21	45	98	211

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	290 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.45	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-23.31	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.10	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.5	59.6	58.2	52.2	60.6	61.3
Medium Trucks:	57.3	53.3	45.5	54.7	60.9	60.9
Heavy Trucks:	63.5	59.5	51.7	60.9	67.1	67.1
Vehicle Noise:	66.2	63.1	59.3	62.3	68.8	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	49	105	226	488
CNEL:	50	107	231	498

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	330 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.77	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-24.00	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-27.96	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.9	57.9	56.6	50.5	59.0	59.6
Medium Trucks:	53.6	49.7	42.2	51.0	57.2	57.2
Heavy Trucks:	54.5	50.4	47.1	51.7	57.9	58.0
Vehicle Noise:	61.7	59.1	57.2	55.9	62.8	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	42	91	197
CNEL:	21	44	96	206

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: e/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.04	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-24.28	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-28.23	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.6	57.6	56.3	50.3	58.7	59.3
Medium Trucks:	53.4	49.5	42.0	50.7	56.9	56.9
Heavy Trucks:	54.2	50.2	46.8	51.4	57.6	57.7
Vehicle Noise:	61.4	58.8	56.9	55.6	62.6	62.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	88	189
CNEL:	20	43	92	198

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	316 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	32 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-16.95	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-34.19	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-38.15	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.7	47.7	46.4	40.4	48.8	49.4
Medium Trucks:	43.5	39.6	32.1	40.8	47.0	47.0
Heavy Trucks:	44.3	40.3	36.9	41.5	47.7	47.8
Vehicle Noise:	51.5	48.9	47.0	45.7	52.7	53.0

Centerline Distance to Noise Contour (in feet)

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

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	216 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	22 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-18.86	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-33.72	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-31.50	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.8	45.9	44.5	38.5	46.9	47.5
Medium Trucks:	43.9	39.9	32.2	41.4	47.5	47.6
Heavy Trucks:	50.9	47.0	39.2	48.4	54.5	54.6
Vehicle Noise:	53.2	49.9	45.8	49.5	55.9	56.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	15	32	68
CNEL:	7	15	32	69

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,120 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.92	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-19.15	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-23.11	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.2	63.2	61.9	55.9	64.3	64.9
Medium Trucks:	58.8	54.9	47.4	56.2	62.3	62.4
Heavy Trucks:	59.2	55.2	51.8	56.4	62.6	62.7
Vehicle Noise:	66.9	64.4	62.5	60.9	68.0	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	120	258	555
CNEL:	58	126	271	583

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,650 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.23	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-17.47	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-21.43	-1.84	-1.20	-5.25	0.000	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	64.9	63.6	57.6	66.0	66.6
Medium Trucks:	60.5	56.6	49.1	57.8	64.0	64.0
Heavy Trucks:	60.9	56.9	53.5	58.1	64.3	64.4
Vehicle Noise:	68.6	66.1	64.1	62.6	69.6	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	155	334	719
CNEL:	75	163	350	755

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,480	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.12	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-18.36	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.31	-1.84	-1.20	-5.25	0.000	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	64.3	58.3	66.7	67.3
Medium Trucks:	61.0	57.1	49.6	58.4	64.5	64.6
Heavy Trucks:	61.0	57.0	53.6	58.2	64.4	64.5
Vehicle Noise:	69.2	66.7	64.8	63.1	70.1	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	77	167	359	775
CNEL:	81	176	378	815

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,240	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.89	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-19.13	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-23.08	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.8	64.8	63.5	57.5	65.9	66.5
Medium Trucks:	60.2	56.3	48.8	57.6	63.8	63.8
Heavy Trucks:	60.3	56.2	52.8	57.5	63.7	63.8
Vehicle Noise:	68.4	65.9	64.0	62.3	69.4	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	148	319	688
CNEL:	72	156	336	724

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,200	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.03	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-19.27	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-23.22	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.7	64.7	63.4	57.4	65.8	66.4
Medium Trucks:	60.1	56.2	48.7	57.4	63.6	63.7
Heavy Trucks:	60.1	56.1	52.7	57.3	63.5	63.6
Vehicle Noise:	68.3	65.8	63.9	62.2	69.2	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	67	145	313	673
CNEL:	71	153	329	708

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	540	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.75	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-20.61	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.40	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.0	61.1	59.7	53.6	62.1	62.7
Medium Trucks:	58.7	54.8	47.0	56.2	62.4	62.4
Heavy Trucks:	65.0	61.0	53.2	62.4	68.6	68.6
Vehicle Noise:	67.7	64.5	60.7	63.8	70.2	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	79	169	365	786
CNEL:	80	173	372	802

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Haun Rd. | Job Number: 11304
Road Segment: n/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	730	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.78	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-21.01	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-24.97	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.6	62.6	61.3	55.3	63.7	64.3
Medium Trucks:	58.2	54.3	46.8	55.5	61.7	61.7
Heavy Trucks:	58.6	54.6	51.2	55.8	62.0	62.1
Vehicle Noise:	66.3	63.8	61.8	60.3	67.3	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	84	182	392
CNEL:	41	89	191	411

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Zeiders Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	140	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-10.95	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-28.19	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-32.14	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.4	55.4	54.1	48.1	56.5	57.1
Medium Trucks:	51.0	47.1	39.6	48.4	54.5	54.6
Heavy Trucks:	51.4	47.4	44.0	48.6	54.8	54.9
Vehicle Noise:	59.1	56.6	54.7	53.1	60.2	60.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	28	60	130
CNEL:	14	29	64	137

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Antelope Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,150	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.80	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-19.04	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-23.00	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	64.6	63.3	57.2	65.7	66.3
Medium Trucks:	60.2	56.3	48.8	57.5	63.7	63.7
Heavy Trucks:	60.6	56.5	53.1	57.8	64.0	64.1
Vehicle Noise:	68.3	65.7	63.8	62.3	69.3	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	246	530
CNEL:	56	120	259	557

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: n/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	660	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	64.0	feet
Centerline Dist. to Observer:	64.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.76	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-20.99	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-24.95	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.4	60.4	59.1	53.1	61.5	62.1
Medium Trucks:	56.2	52.3	44.8	53.5	59.7	59.7
Heavy Trucks:	57.0	53.0	49.6	54.2	60.4	60.5
Vehicle Noise:	64.2	61.7	59.7	58.4	65.4	65.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	68	146	315
CNEL:	33	71	153	330

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: s/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	580 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.32	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-21.56	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.51	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.8	59.8	58.5	52.5	60.9	61.6
Medium Trucks:	55.6	51.7	44.2	53.0	59.1	59.2
Heavy Trucks:	56.5	52.4	49.0	53.7	59.9	60.0
Vehicle Noise:	63.7	61.1	59.1	57.8	64.8	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	62	134	289
CNEL:	30	65	140	303

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Craig Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	290 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.48	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-21.35	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-19.13	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.0	54.1	52.7	46.7	55.1	55.8
Medium Trucks:	52.6	48.6	40.8	50.0	56.2	56.2
Heavy Trucks:	60.6	56.7	48.9	58.1	64.2	64.3
Vehicle Noise:	62.4	59.0	54.4	59.0	65.3	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	62	133	287
CNEL:	29	63	135	291

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Garbani Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	330 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-7.89	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-22.75	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.53	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.1	60.2	58.8	52.7	61.2	61.8
Medium Trucks:	57.9	53.9	46.1	55.3	61.5	61.5
Heavy Trucks:	64.1	60.1	52.3	61.5	67.7	67.7
Vehicle Noise:	66.8	63.6	59.8	62.9	69.3	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	115	247	532
CNEL:	54	117	252	542

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	320 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.02	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-22.89	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.67	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.9	60.0	58.6	52.6	61.1	61.7
Medium Trucks:	57.7	53.7	46.0	55.2	61.3	61.4
Heavy Trucks:	63.9	59.9	52.2	61.4	67.5	67.6
Vehicle Noise:	66.7	63.5	59.7	62.7	69.2	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	112	242	521
CNEL:	53	114	247	531

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	330	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.77	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-24.00	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-27.96	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.9	57.9	56.6	50.5	59.0	59.6
Medium Trucks:	53.6	49.7	42.2	51.0	57.2	57.2
Heavy Trucks:	54.5	50.4	47.1	51.7	57.9	58.0
Vehicle Noise:	61.7	59.1	57.2	55.9	62.8	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	42	91	197
CNEL:	21	44	96	206

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: e/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	350	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.51	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-23.75	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-27.70	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.1	58.1	56.8	50.8	59.2	59.8
Medium Trucks:	53.9	50.0	42.5	51.3	57.4	57.5
Heavy Trucks:	54.7	50.7	47.3	52.0	58.2	58.2
Vehicle Noise:	62.0	59.4	57.4	56.1	63.1	63.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	44	95	204
CNEL:	21	46	99	214

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	80	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-12.92	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-30.16	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-34.11	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.7	51.7	50.4	44.4	52.8	53.4
Medium Trucks:	47.5	43.6	36.1	44.8	51.0	51.1
Heavy Trucks:	48.3	44.3	40.9	45.5	51.7	51.8
Vehicle Noise:	55.6	53.0	51.0	49.7	56.7	57.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	16	35	76
CNEL:	8	17	37	80

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	70	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-13.75	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-28.62	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-26.40	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.9	51.0	49.6	43.6	52.0	52.6
Medium Trucks:	49.0	45.1	37.3	46.5	52.6	52.7
Heavy Trucks:	56.1	52.1	44.3	53.5	59.7	59.7
Vehicle Noise:	58.3	55.0	50.9	54.6	61.0	61.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	32	69	149
CNEL:	15	33	70	151

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,140 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.84	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-19.08	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-23.03	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.3	63.3	62.0	56.0	64.4	65.0
Medium Trucks:	58.9	55.0	47.5	56.2	62.4	62.4
Heavy Trucks:	59.3	55.3	51.9	56.5	62.7	62.8
Vehicle Noise:	67.0	64.5	62.5	61.0	68.0	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	261	562
CNEL:	59	127	274	590

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,700 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.10	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-17.34	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-21.30	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	65.0	63.7	57.7	66.1	66.8
Medium Trucks:	60.6	56.7	49.2	58.0	64.1	64.2
Heavy Trucks:	61.0	57.0	53.6	58.2	64.4	64.5
Vehicle Noise:	68.7	66.2	64.3	62.8	69.8	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	158	340	733
CNEL:	77	166	357	770

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,690 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.54	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-17.78	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.74	-1.84	-1.20	-5.25	0.000	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	66.2	64.9	58.8	67.3	67.9
Medium Trucks:	61.6	57.7	50.2	58.9	65.1	65.1
Heavy Trucks:	61.6	57.6	54.2	58.8	65.0	65.1
Vehicle Noise:	69.8	67.2	65.4	63.6	70.7	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	85	182	393	846
CNEL:	89	192	413	890

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,450 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.21	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-18.45	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.40	-1.84	-1.20	-5.25	0.000	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	65.5	64.2	58.2	66.6	67.2
Medium Trucks:	60.9	57.0	49.5	58.3	64.4	64.5
Heavy Trucks:	61.0	56.9	53.5	58.2	64.4	64.5
Vehicle Noise:	69.1	66.6	64.7	63.0	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	165	355	764
CNEL:	80	173	373	804

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,400	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.36	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-18.60	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.56	-1.84	-1.20	-5.25	0.000	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	64.0	58.0	66.5	67.1
Medium Trucks:	60.8	56.9	49.4	58.1	64.3	64.3
Heavy Trucks:	60.8	56.8	53.4	58.0	64.2	64.3
Vehicle Noise:	68.9	66.4	64.5	62.8	69.9	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	75	161	346	746
CNEL:	79	169	364	785

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	570	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.51	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-20.38	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.16	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.2	61.3	59.9	53.9	62.3	63.0
Medium Trucks:	59.0	55.0	47.2	56.4	62.6	62.6
Heavy Trucks:	65.2	61.2	53.4	62.6	68.8	68.8
Vehicle Noise:	67.9	64.8	61.0	64.0	70.5	70.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	82	176	378	815
CNEL:	83	179	386	832

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Haun Rd. | Job Number: 11304
Road Segment: n/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	770	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.54	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-20.78	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-24.74	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.8	62.8	61.5	55.5	63.9	64.6
Medium Trucks:	58.4	54.5	47.0	55.8	61.9	62.0
Heavy Trucks:	58.8	54.8	51.4	56.0	62.2	62.3
Vehicle Noise:	66.5	64.0	62.1	60.5	67.6	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	87	188	406
CNEL:	43	92	198	426

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Zeiders Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	140	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-10.95	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-28.19	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-32.14	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.4	55.4	54.1	48.1	56.5	57.1
Medium Trucks:	51.0	47.1	39.6	48.4	54.5	54.6
Heavy Trucks:	51.4	47.4	44.0	48.6	54.8	54.9
Vehicle Noise:	59.1	56.6	54.7	53.1	60.2	60.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	28	60	130
CNEL:	14	29	64	137

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Antelope Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,210 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.58	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-18.82	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-22.77	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.8	64.8	63.5	57.5	65.9	66.5
Medium Trucks:	60.4	56.5	49.0	57.7	63.9	63.9
Heavy Trucks:	60.8	56.8	53.4	58.0	64.2	64.3
Vehicle Noise:	68.5	65.9	64.0	62.5	69.5	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	255	549
CNEL:	58	124	267	576

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: n/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	690 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.56	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-20.80	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-24.76	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.6	60.6	59.3	53.3	61.7	62.3
Medium Trucks:	56.4	52.5	45.0	53.7	59.9	59.9
Heavy Trucks:	57.2	53.2	49.8	54.4	60.6	60.7
Vehicle Noise:	64.4	61.8	59.9	58.6	65.6	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	70	150	324
CNEL:	34	73	158	340

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: s/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	610 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.10	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-21.34	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.29	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.1	60.1	58.7	52.7	61.2	61.8
Medium Trucks:	55.8	51.9	44.4	53.2	59.4	59.4
Heavy Trucks:	56.7	52.6	49.2	53.9	60.1	60.2
Vehicle Noise:	63.9	61.3	59.3	58.1	65.0	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	64	139	298
CNEL:	31	67	145	313

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Craig Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	40 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-15.09	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-29.95	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-27.74	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.4	45.5	44.1	38.1	46.5	47.1
Medium Trucks:	44.0	40.0	32.2	41.4	47.6	47.6
Heavy Trucks:	52.0	48.0	40.3	49.5	55.6	55.7
Vehicle Noise:	53.8	50.4	45.8	50.4	56.7	56.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	17	36	77
CNEL:	8	17	36	78

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Garbani Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	80 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-14.04	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-28.91	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-26.69	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.9	54.0	52.6	46.6	55.1	55.7
Medium Trucks:	51.7	47.7	39.9	49.1	55.3	55.3
Heavy Trucks:	57.9	53.9	46.1	55.4	61.5	61.5
Vehicle Noise:	60.6	57.5	53.7	56.7	63.2	63.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	45	96	207
CNEL:	21	45	98	211

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.16	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-23.02	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.81	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.8	59.9	58.5	52.5	60.9	61.6
Medium Trucks:	57.6	53.6	45.8	55.0	61.2	61.2
Heavy Trucks:	63.8	59.8	52.0	61.2	67.4	67.4
Vehicle Noise:	66.5	63.4	59.6	62.6	69.0	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	51	110	237	510
CNEL:	52	112	241	520

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	350 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.51	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-23.75	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-27.70	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.1	58.1	56.8	50.8	59.2	59.8
Medium Trucks:	53.9	50.0	42.5	51.3	57.4	57.5
Heavy Trucks:	54.7	50.7	47.3	52.0	58.2	58.2
Vehicle Noise:	62.0	59.4	57.4	56.1	63.1	63.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	44	95	204
CNEL:	21	46	99	214

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: e/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	330 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.77	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-24.00	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-27.96	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.9	57.9	56.6	50.5	59.0	59.6
Medium Trucks:	53.6	49.7	42.2	51.0	57.2	57.2
Heavy Trucks:	54.5	50.4	47.1	51.7	57.9	58.0
Vehicle Noise:	61.7	59.1	57.2	55.9	62.8	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	42	91	197
CNEL:	21	44	96	206

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	432 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	43 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-15.60	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-32.83	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-36.79	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.0	49.0	47.7	41.7	50.1	50.8
Medium Trucks:	44.8	40.9	33.4	42.2	48.3	48.4
Heavy Trucks:	45.7	41.6	38.2	42.9	49.1	49.2
Vehicle Noise:	52.9	50.3	48.3	47.0	54.0	54.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	11	24	51
CNEL:	5	11	25	53

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	232 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	23 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-18.54	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-33.41	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-31.19	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	48.1	46.2	44.8	38.8	47.2	47.8
Medium Trucks:	44.2	40.3	32.5	41.7	47.8	47.9
Heavy Trucks:	51.3	47.3	39.5	48.7	54.9	54.9
Vehicle Noise:	53.5	50.2	46.1	49.8	56.2	56.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	15	33	71
CNEL:	7	16	34	72

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,220 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.54	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-18.78	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-22.74	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	63.6	62.3	56.3	64.7	65.3
Medium Trucks:	59.2	55.3	47.8	56.5	62.7	62.7
Heavy Trucks:	59.6	55.6	52.2	56.8	63.0	63.1
Vehicle Noise:	67.3	64.7	62.8	61.3	68.3	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	127	273	588
CNEL:	62	133	287	617

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,780 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.10	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-17.14	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-21.10	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.2	63.9	57.9	66.3	67.0
Medium Trucks:	60.8	56.9	49.4	58.2	64.3	64.4
Heavy Trucks:	61.2	57.2	53.8	58.4	64.6	64.7
Vehicle Noise:	68.9	66.4	64.5	63.0	70.0	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	163	351	756
CNEL:	79	171	369	794

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,610	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.75	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-17.99	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.95	-1.84	-1.20	-5.25	0.000	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	64.6	58.6	67.1	67.7
Medium Trucks:	61.4	57.5	50.0	58.7	64.9	64.9
Heavy Trucks:	61.4	57.4	54.0	58.6	64.8	64.9
Vehicle Noise:	69.6	67.0	65.1	63.4	70.5	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	82	176	380	819
CNEL:	86	186	400	862

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,340	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.55	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-18.79	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.75	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.2	63.9	57.8	66.3	66.9
Medium Trucks:	60.6	56.7	49.2	57.9	64.1	64.1
Heavy Trucks:	60.6	56.6	53.2	57.8	64.0	64.1
Vehicle Noise:	68.8	66.2	64.3	62.6	69.7	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	156	336	725
CNEL:	76	164	354	762

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,300	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.68	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-18.92	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.88	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	65.0	63.7	57.7	66.1	66.8
Medium Trucks:	60.4	56.5	49.0	57.8	64.0	64.0
Heavy Trucks:	60.5	56.4	53.0	57.7	63.9	64.0
Vehicle Noise:	68.6	66.1	64.2	62.5	69.6	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	71	153	330	710
CNEL:	75	161	347	747

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2025 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	590	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.36	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-20.23	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.01	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.4	61.5	60.1	54.0	62.5	63.1
Medium Trucks:	59.1	55.2	47.4	56.6	62.7	62.8
Heavy Trucks:	65.3	61.4	53.6	62.8	68.9	69.0
Vehicle Noise:	68.1	64.9	61.1	64.2	70.6	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	83	180	387	834
CNEL:	85	183	395	851

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Haun Rd.
Road Segment: n/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	810	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.32	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-20.56	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-24.52	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.1	63.0	61.7	55.7	64.1	64.8
Medium Trucks:	58.6	54.7	47.2	56.0	62.2	62.2
Heavy Trucks:	59.1	55.0	51.6	56.3	62.5	62.6
Vehicle Noise:	66.8	64.2	62.3	60.8	67.8	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	90	195	420
CNEL:	44	95	205	441

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Zeiders Rd.
Road Segment: s/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	150	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-10.65	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-27.89	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-31.84	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.7	55.7	54.4	48.4	56.8	57.4
Medium Trucks:	51.3	47.4	39.9	48.7	54.8	54.9
Heavy Trucks:	51.7	47.7	44.3	48.9	55.1	55.2
Vehicle Noise:	59.4	56.9	55.0	53.4	60.5	60.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	29	63	136
CNEL:	14	31	67	143

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Antelope Rd.
Road Segment: s/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,250	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.44	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-18.68	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-22.63	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.9	64.9	63.6	57.6	66.0	66.7
Medium Trucks:	60.5	56.6	49.1	57.9	64.0	64.1
Heavy Trucks:	60.9	56.9	53.5	58.1	64.3	64.4
Vehicle Noise:	68.6	66.1	64.2	62.7	69.7	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	260	561
CNEL:	59	127	273	589

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Menifee Rd.
Road Segment: n/o Holland Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	730	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	64.0	feet
Centerline Dist. to Observer:	64.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.32	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-20.56	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-24.51	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.8	60.8	59.5	53.5	61.9	62.6
Medium Trucks:	56.6	52.7	45.2	54.0	60.1	60.2
Heavy Trucks:	57.5	53.4	50.0	54.7	60.9	61.0
Vehicle Noise:	64.7	62.1	60.1	58.8	65.8	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	72	156	336
CNEL:	35	76	164	353

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: s/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	630 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.96	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-21.20	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.15	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.2	60.2	58.9	52.9	61.3	61.9
Medium Trucks:	56.0	52.1	44.6	53.3	59.5	59.5
Heavy Trucks:	56.8	52.8	49.4	54.0	60.2	60.3
Vehicle Noise:	64.0	61.5	59.5	58.2	65.2	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	66	142	305
CNEL:	32	69	148	320

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Craig Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	500 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-4.12	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-18.99	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-16.77	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.4	56.5	55.1	49.0	57.5	58.1
Medium Trucks:	55.0	51.0	43.2	52.4	58.6	58.6
Heavy Trucks:	63.0	59.0	51.2	60.4	66.6	66.6
Vehicle Noise:	64.8	61.4	56.8	61.3	67.7	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	89	192	413
CNEL:	42	90	194	419

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Garbani Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	540 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.75	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-20.61	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.40	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	62.3	60.9	54.9	63.3	64.0
Medium Trucks:	60.0	56.0	48.2	57.4	63.6	63.6
Heavy Trucks:	66.2	62.2	54.4	63.6	69.8	69.8
Vehicle Noise:	68.9	65.8	62.0	65.0	71.5	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	74	159	343	738
CNEL:	75	162	350	753

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	360 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-7.51	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-22.37	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.16	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.5	60.6	59.1	53.1	61.6	62.2
Medium Trucks:	58.2	54.2	46.5	55.7	61.8	61.9
Heavy Trucks:	64.4	60.5	52.7	61.9	68.0	68.1
Vehicle Noise:	67.2	64.0	60.2	63.3	69.7	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	261	563
CNEL:	57	124	267	575

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	360	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.39	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-23.63	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-27.58	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.3	58.2	56.9	50.9	59.3	60.0
Medium Trucks:	54.0	50.1	42.6	51.4	57.5	57.6
Heavy Trucks:	54.9	50.8	47.4	52.1	58.3	58.4
Vehicle Noise:	62.1	59.5	57.5	56.3	63.2	63.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	45	97	208
CNEL:	22	47	101	218

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: e/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	410	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-5.82	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-23.06	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-27.02	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.8	58.8	57.5	51.5	59.9	60.5
Medium Trucks:	54.6	50.7	43.2	51.9	58.1	58.1
Heavy Trucks:	55.4	51.4	48.0	52.6	58.8	58.9
Vehicle Noise:	62.7	60.1	58.1	56.8	63.8	64.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	105	227
CNEL:	24	51	111	238

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	130	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-10.81	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-28.05	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-32.01	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.8	53.8	52.5	46.5	54.9	55.5
Medium Trucks:	49.6	45.7	38.2	47.0	53.1	53.2
Heavy Trucks:	50.4	46.4	43.0	47.7	53.8	53.9
Vehicle Noise:	57.7	55.1	53.1	51.8	58.8	59.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	11	23	49	106
CNEL:	11	24	51	111

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	110	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-11.79	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-26.65	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-24.43	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.9	53.0	51.5	45.5	54.0	54.6
Medium Trucks:	51.0	47.0	39.2	48.4	54.6	54.6
Heavy Trucks:	58.0	54.0	46.3	55.5	61.6	61.7
Vehicle Noise:	60.3	57.0	52.9	56.6	63.0	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	93	201
CNEL:	20	44	95	205

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Scott Rd.
Road Segment: w/o Haun Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,260	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.40	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-18.64	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-22.60	-1.84	-1.20	-5.25	0.000	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	63.7	62.4	56.4	64.8	65.5
Medium Trucks:	59.3	55.4	47.9	56.7	62.8	62.9
Heavy Trucks:	59.7	55.7	52.3	56.9	63.1	63.2
Vehicle Noise:	67.4	64.9	63.0	61.5	68.5	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	60	129	279	601
CNEL:	63	136	293	631

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Scott Rd.
Road Segment: e/o Haun Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,880	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.33	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-16.91	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-20.86	-1.84	-1.20	-5.25	0.000	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	65.5	64.2	58.1	66.6	67.2
Medium Trucks:	61.1	57.2	49.7	58.4	64.6	64.6
Heavy Trucks:	61.5	57.4	54.0	58.7	64.9	65.0
Vehicle Noise:	69.2	66.6	64.7	63.2	70.2	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	78	169	364	784
CNEL:	82	177	382	824

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Scott Rd.
Road Segment: w/o Menifee Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,980	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.14	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-17.09	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.05	-1.84	-1.20	-5.25	0.000	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	66.9	65.5	59.5	68.0	68.6
Medium Trucks:	62.3	58.4	50.9	59.6	65.8	65.8
Heavy Trucks:	62.3	58.3	54.9	59.5	65.7	65.8
Vehicle Noise:	70.5	67.9	66.0	64.3	71.4	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	94	203	436	940
CNEL:	99	213	459	989

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Scott Rd.
Road Segment: w/o Briggs Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,720	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.47	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-17.71	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.66	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.3	66.2	64.9	58.9	67.3	68.0
Medium Trucks:	61.7	57.8	50.3	59.0	65.2	65.2
Heavy Trucks:	61.7	57.6	54.3	58.9	65.1	65.2
Vehicle Noise:	69.8	67.3	65.4	63.7	70.8	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	86	184	397	856
CNEL:	90	194	418	901

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Scott Rd.
Road Segment: w/o Leon Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,670	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.60	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-17.83	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.79	-1.84	-1.20	-5.25	0.000	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	66.1	64.8	58.8	67.2	67.8
Medium Trucks:	61.5	57.6	50.1	58.9	65.1	65.1
Heavy Trucks:	61.6	57.5	54.1	58.8	65.0	65.1
Vehicle Noise:	69.7	67.2	65.3	63.6	70.6	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	181	390	839
CNEL:	88	190	410	883

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Scott Rd.
Road Segment: e/o Leon Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	630	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.08	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-19.94	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-17.73	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.6	61.7	60.3	54.3	62.8	63.4
Medium Trucks:	59.4	55.4	47.7	56.9	63.0	63.1
Heavy Trucks:	65.6	61.6	53.9	63.1	69.2	69.3
Vehicle Noise:	68.4	65.2	61.4	64.5	70.9	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	87	188	404	871
CNEL:	89	192	413	889

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021
Road Name: Haun Rd.
Road Segment: n/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,820	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.19	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-17.05	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-21.00	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.6	66.6	65.3	59.2	67.7	68.3
Medium Trucks:	62.2	58.3	50.8	59.5	65.7	65.7
Heavy Trucks:	62.6	58.5	55.1	59.8	66.0	66.1
Vehicle Noise:	70.3	67.7	65.8	64.3	71.3	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	155	334	720
CNEL:	76	163	351	757

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021
Road Name: Zeiders Rd.
Road Segment: s/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	560	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-4.93	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-22.17	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-26.12	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.5	61.4	60.1	54.1	62.5	63.2
Medium Trucks:	57.0	53.1	45.6	54.4	60.6	60.6
Heavy Trucks:	57.5	53.4	50.0	54.7	60.9	61.0
Vehicle Noise:	65.2	62.6	60.7	59.2	66.2	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	71	152	328
CNEL:	34	74	160	345

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Antelope Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,590	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.39	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-17.63	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-21.59	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.0	64.7	58.7	67.1	67.7
Medium Trucks:	61.6	57.7	50.2	58.9	65.1	65.1
Heavy Trucks:	62.0	57.9	54.5	59.2	65.4	65.5
Vehicle Noise:	69.7	67.1	65.2	63.7	70.7	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	66	142	306	658
CNEL:	69	149	321	691

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: n/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,370	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	64.0	feet
Centerline Dist. to Observer:	64.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.58	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-17.82	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-21.78	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	63.6	62.3	56.2	64.7	65.3
Medium Trucks:	59.3	55.4	47.9	56.7	62.9	62.9
Heavy Trucks:	60.2	56.1	52.8	57.4	63.6	63.7
Vehicle Noise:	67.4	64.8	62.9	61.6	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	51	110	238	512
CNEL:	54	116	249	537

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: s/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,410	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	64.0	feet
Centerline Dist. to Observer:	64.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.46	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-17.70	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-21.65	-1.08	-1.20	-5.31	0.000	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	63.7	62.4	56.4	64.8	65.4
Medium Trucks:	59.5	55.6	48.1	56.8	63.0	63.0
Heavy Trucks:	60.3	56.3	52.9	57.5	63.7	63.8
Vehicle Noise:	67.5	65.0	63.0	61.7	68.7	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	112	242	522
CNEL:	55	118	254	547

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Craig Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	180	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-8.56	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-23.42	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-21.20	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.9	52.0	50.6	44.6	53.1	53.7
Medium Trucks:	50.5	46.5	38.8	48.0	54.1	54.2
Heavy Trucks:	58.6	54.6	46.8	56.0	62.2	62.2
Vehicle Noise:	60.3	56.9	52.3	56.9	63.2	63.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	45	97	209
CNEL:	21	46	98	212

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Garbani Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	260	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.92	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-23.79	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.57	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.0	59.1	57.7	51.7	60.2	60.8
Medium Trucks:	56.8	52.8	45.1	54.3	60.4	60.5
Heavy Trucks:	63.0	59.0	51.3	60.5	66.6	66.7
Vehicle Noise:	65.7	62.6	58.8	61.8	68.3	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	98	210	454
CNEL:	46	100	215	463

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	620	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.15	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-20.01	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-17.80	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.8	62.9	61.5	55.5	63.9	64.6
Medium Trucks:	60.6	56.6	48.8	58.0	64.2	64.2
Heavy Trucks:	66.8	62.8	55.0	64.2	70.4	70.4
Vehicle Noise:	69.5	66.4	62.6	65.6	72.1	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	81	174	376	809
CNEL:	83	178	383	826

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	850	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.66	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-19.90	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.85	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.0	62.0	60.7	54.6	63.1	63.7
Medium Trucks:	57.8	53.9	46.4	55.1	61.3	61.3
Heavy Trucks:	58.6	54.6	51.2	55.8	62.0	62.1
Vehicle Noise:	65.8	63.2	61.3	60.0	67.0	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	80	171	369
CNEL:	39	83	180	387

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: e/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	850	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.66	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-19.90	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.85	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.0	62.0	60.7	54.6	63.1	63.7
Medium Trucks:	57.8	53.9	46.4	55.1	61.3	61.3
Heavy Trucks:	58.6	54.6	51.2	55.8	62.0	62.1
Vehicle Noise:	65.8	63.2	61.3	60.0	67.0	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	80	171	369
CNEL:	39	83	180	387

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,316	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	132	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-10.76	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-28.00	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-31.95	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.9	53.9	52.6	46.5	55.0	55.6
Medium Trucks:	49.7	45.8	38.3	47.0	53.2	53.2
Heavy Trucks:	50.5	46.5	43.1	47.7	53.9	54.0
Vehicle Noise:	57.7	55.1	53.2	51.9	58.8	59.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	11	23	49	107
CNEL:	11	24	52	112

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	616	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	62	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-14.30	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-29.17	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-26.95	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.3	50.4	49.0	43.0	51.5	52.1
Medium Trucks:	48.5	44.5	36.7	45.9	52.1	52.1
Heavy Trucks:	55.5	51.5	43.7	52.9	59.1	59.1
Vehicle Noise:	57.8	54.5	50.3	54.1	60.5	60.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	29	63	137
CNEL:	14	30	65	139

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,820	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.19	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-17.05	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-21.00	-1.84	-1.20	-5.25	0.000	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	65.3	64.0	58.0	66.4	67.1
Medium Trucks:	60.9	57.0	49.5	58.3	64.4	64.5
Heavy Trucks:	61.3	57.3	53.9	58.5	64.7	64.8
Vehicle Noise:	69.0	66.5	64.6	63.0	70.1	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	77	165	356	767
CNEL:	81	174	374	806

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,000	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	2.36	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-14.88	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-18.83	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.5	66.2	60.2	68.6	69.2
Medium Trucks:	63.1	59.2	51.7	60.4	66.6	66.6
Heavy Trucks:	63.5	59.5	56.1	60.7	66.9	67.0
Vehicle Noise:	71.2	68.7	66.7	65.2	72.2	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	107	231	497	1,071
CNEL:	112	242	522	1,125

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,650	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.41	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-15.83	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-19.78	-1.84	-1.20	-5.25	0.000	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	68.1	66.8	60.8	69.2	69.8
Medium Trucks:	63.5	59.6	52.1	60.9	67.1	67.1
Heavy Trucks:	63.6	59.5	56.1	60.8	67.0	67.1
Vehicle Noise:	71.7	69.2	67.3	65.6	72.7	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	114	246	530	1,142
CNEL:	120	259	558	1,201

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,320	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.83	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-16.41	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.36	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.5	66.2	60.2	68.6	69.3
Medium Trucks:	63.0	59.1	51.6	60.3	66.5	66.5
Heavy Trucks:	63.0	58.9	55.6	60.2	66.4	66.5
Vehicle Noise:	71.1	68.6	66.7	65.0	72.1	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	105	225	485	1,045
CNEL:	110	237	510	1,099

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,990	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.17	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-17.07	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.03	-1.84	-1.20	-5.25	0.000	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	66.9	65.6	59.6	68.0	68.6
Medium Trucks:	62.3	58.4	50.9	59.6	65.8	65.9
Heavy Trucks:	62.3	58.3	54.9	59.5	65.7	65.8
Vehicle Noise:	70.5	68.0	66.1	64.3	71.4	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	94	203	438	944
CNEL:	99	214	461	993

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,070	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.78	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-17.64	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.43	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.9	64.1	62.6	56.6	65.1	65.7
Medium Trucks:	61.7	57.7	50.0	59.2	65.3	65.4
Heavy Trucks:	67.9	63.9	56.2	65.4	71.5	71.6
Vehicle Noise:	70.7	67.5	63.7	66.8	73.2	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	124	267	576	1,240
CNEL:	127	273	587	1,265

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Haun Rd.
Road Segment: n/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,840	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.24	-0.62	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	81.00	-17.00	-0.60	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-20.95	-0.60	-1.20	*-5.35*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.6	66.6	65.3	59.3	67.7	68.3
Medium Trucks:	62.2	58.3	50.8	59.6	65.7	65.8
Heavy Trucks:	62.6	58.6	55.2	59.8	66.0	66.1
Vehicle Noise:	70.3	67.8	65.8	64.3	71.3	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	156	337	726
CNEL:	76	164	354	762

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Zeiders Rd.
Road Segment: s/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	570	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-4.85	-0.62	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	81.00	-22.09	-0.60	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-26.04	-0.60	-1.20	*-5.35*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.5	61.5	60.2	54.2	62.6	63.2
Medium Trucks:	57.1	53.2	45.7	54.5	60.6	60.7
Heavy Trucks:	57.5	53.5	50.1	54.7	60.9	61.0
Vehicle Noise:	65.2	62.7	60.8	59.2	66.3	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	72	154	332
CNEL:	35	75	162	349

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Antelope Rd.
Road Segment: s/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,610	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.34	-0.62	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	81.00	-17.58	-0.60	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-21.53	-0.60	-1.20	*-5.35*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.0	64.7	58.7	67.1	67.8
Medium Trucks:	61.6	57.7	50.2	59.0	65.1	65.2
Heavy Trucks:	62.0	58.0	54.6	59.2	65.4	65.5
Vehicle Noise:	69.7	67.2	65.3	63.8	70.8	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	66	143	308	664
CNEL:	70	150	324	697

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Menifee Rd.
Road Segment: n/o Holland Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,390	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	64.0	feet
Centerline Dist. to Observer:	64.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.52	-1.10	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	79.45	-17.76	-1.08	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.72	-1.08	-1.20	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	63.6	62.3	56.3	64.7	65.4
Medium Trucks:	59.4	55.5	48.0	56.8	62.9	63.0
Heavy Trucks:	60.3	56.2	52.8	57.5	63.7	63.8
Vehicle Noise:	67.5	64.9	62.9	61.6	68.6	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	111	240	517
CNEL:	54	117	251	542

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: s/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,420	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	64.0	feet
Centerline Dist. to Observer:	64.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.43	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-17.67	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-21.62	-1.08	-1.20	-5.31	0.000	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	63.7	62.4	56.4	64.8	65.4
Medium Trucks:	59.5	55.6	48.1	56.9	63.0	63.1
Heavy Trucks:	60.3	56.3	52.9	57.6	63.8	63.8
Vehicle Noise:	67.6	65.0	63.0	61.7	68.7	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	113	243	524
CNEL:	55	118	255	550

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Craig Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	430	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-4.77	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-19.64	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-17.42	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.7	55.8	54.4	48.4	56.8	57.5
Medium Trucks:	54.3	50.3	42.5	51.8	57.9	57.9
Heavy Trucks:	62.3	58.4	50.6	59.8	65.9	66.0
Vehicle Noise:	64.1	60.7	56.1	60.7	67.0	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	80	173	373
CNEL:	38	82	176	379

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Garbani Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	510	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-6.00	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-20.86	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.64	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.0	62.1	60.7	54.6	63.1	63.7
Medium Trucks:	59.7	55.8	48.0	57.2	63.3	63.4
Heavy Trucks:	66.0	62.0	54.2	63.4	69.6	69.6
Vehicle Noise:	68.7	65.5	61.7	64.8	71.2	71.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	71	153	330	711
CNEL:	72	156	337	725

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	650	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.94	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.81	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-17.59	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.0	63.1	61.7	55.7	64.2	64.8
Medium Trucks:	60.8	56.8	49.0	58.2	64.4	64.4
Heavy Trucks:	67.0	63.0	55.2	64.5	70.6	70.6
Vehicle Noise:	69.7	66.6	62.8	65.8	72.3	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	180	388	835
CNEL:	85	184	396	852

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	850	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.66	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-19.90	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.85	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.0	62.0	60.7	54.6	63.1	63.7
Medium Trucks:	57.8	53.9	46.4	55.1	61.3	61.3
Heavy Trucks:	58.6	54.6	51.2	55.8	62.0	62.1
Vehicle Noise:	65.8	63.2	61.3	60.0	67.0	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	80	171	369
CNEL:	39	83	180	387

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: e/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	890	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.46	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-19.70	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.65	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	62.2	60.9	54.8	63.3	63.9
Medium Trucks:	58.0	54.1	46.6	55.3	61.5	61.5
Heavy Trucks:	58.8	54.8	51.4	56.0	62.2	62.3
Vehicle Noise:	66.0	63.4	61.5	60.2	67.2	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	38	82	177	381
CNEL:	40	86	185	399

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	180	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.40	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-26.64	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-30.59	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.2	55.2	53.9	47.9	56.3	57.0
Medium Trucks:	51.0	47.1	39.6	48.4	54.5	54.6
Heavy Trucks:	51.9	47.8	44.4	49.1	55.3	55.4
Vehicle Noise:	59.1	56.5	54.5	53.2	60.2	60.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	28	61	131
CNEL:	14	30	64	138

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	110	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-11.79	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-26.65	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-24.43	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.9	53.0	51.5	45.5	54.0	54.6
Medium Trucks:	51.0	47.0	39.2	48.4	54.6	54.6
Heavy Trucks:	58.0	54.0	46.3	55.5	61.6	61.7
Vehicle Noise:	60.3	57.0	52.9	56.6	63.0	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	93	201
CNEL:	20	44	95	205

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Scott Rd.
Road Segment: w/o Haun Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,840	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.24	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-17.00	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-20.95	-1.84	-1.20	-5.25	0.000	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	64.1	58.1	66.5	67.1
Medium Trucks:	61.0	57.1	49.6	58.3	64.5	64.5
Heavy Trucks:	61.4	57.3	53.9	58.6	64.8	64.9
Vehicle Noise:	69.1	66.5	64.6	63.1	70.1	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	77	167	359	773
CNEL:	81	175	377	812

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Scott Rd.
Road Segment: e/o Haun Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,050	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	2.43	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-14.80	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-18.76	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.6	66.3	60.2	68.7	69.3
Medium Trucks:	63.2	59.3	51.8	60.5	66.7	66.7
Heavy Trucks:	63.6	59.5	56.1	60.8	67.0	67.1
Vehicle Noise:	71.3	68.7	66.8	65.3	72.3	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	108	233	503	1,083
CNEL:	114	245	528	1,137

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Scott Rd.
Road Segment: w/o Menifee Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,860	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.74	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-15.50	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-19.45	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	68.5	67.1	61.1	69.6	70.2
Medium Trucks:	63.9	60.0	52.5	61.2	67.4	67.4
Heavy Trucks:	63.9	59.9	56.5	61.1	67.3	67.4
Vehicle Noise:	72.0	69.5	67.6	65.9	73.0	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	120	259	558	1,202
CNEL:	126	272	587	1,264

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Scott Rd.
Road Segment: w/o Briggs Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,530	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.21	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-16.03	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-19.99	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.9	67.9	66.6	60.6	69.0	69.6
Medium Trucks:	63.3	59.4	51.9	60.7	66.9	66.9
Heavy Trucks:	63.4	59.3	55.9	60.6	66.8	66.9
Vehicle Noise:	71.5	69.0	67.1	65.4	72.5	72.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	111	239	514	1,107
CNEL:	116	251	541	1,165

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Scott Rd.
Road Segment: w/o Leon Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,190 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.58	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-16.66	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.61	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.3	67.3	66.0	60.0	68.4	69.0
Medium Trucks:	62.7	58.8	51.3	60.1	66.2	66.3
Heavy Trucks:	62.7	58.7	55.3	59.9	66.1	66.2
Vehicle Noise:	70.9	68.4	66.5	64.8	71.8	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	101	217	467	1,006
CNEL:	106	228	491	1,058

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P 2025
Road Name: Scott Rd.
Road Segment: e/o Leon Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,100 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.66	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-17.52	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.31	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.2	62.8	56.7	65.2	65.8
Medium Trucks:	61.8	57.9	50.1	59.3	65.4	65.5
Heavy Trucks:	68.0	64.1	56.3	65.5	71.7	71.7
Vehicle Noise:	70.8	67.6	63.8	66.9	73.3	73.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	126	272	586	1,263
CNEL:	129	278	598	1,289

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021
Road Name: Haun Rd.
Road Segment: n/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,240 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.09	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-16.14	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-20.10	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.5	66.2	60.1	68.6	69.2
Medium Trucks:	63.1	59.2	51.7	60.4	66.6	66.6
Heavy Trucks:	63.5	59.4	56.0	60.7	66.9	67.0
Vehicle Noise:	71.2	68.6	66.7	65.2	72.2	72.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	83	178	384	827
CNEL:	87	187	403	869

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021
Road Name: Zeiders Rd.
Road Segment: s/o Scott Rd.
Project Name: Canterwood
Job Number: 11304

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	720 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.84	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-21.07	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-25.03	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.5	62.5	61.2	55.2	63.6	64.3
Medium Trucks:	58.1	54.2	46.7	55.5	61.6	61.7
Heavy Trucks:	58.5	54.5	51.1	55.8	62.0	62.0
Vehicle Noise:	66.2	63.7	61.8	60.3	67.3	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	84	180	388
CNEL:	41	88	189	408

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Antelope Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,830 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.22	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-17.02	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-20.98	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.6	66.6	65.3	59.3	67.7	68.3
Medium Trucks:	62.2	58.3	50.8	59.5	65.7	65.7
Heavy Trucks:	62.6	58.6	55.2	59.8	66.0	66.1
Vehicle Noise:	70.3	67.7	65.8	64.3	71.3	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	156	336	723
CNEL:	76	164	352	759

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: n/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,670 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.28	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-16.96	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.92	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.4	63.1	57.1	65.5	66.2
Medium Trucks:	60.2	56.3	48.8	57.6	63.7	63.8
Heavy Trucks:	61.1	57.0	53.6	58.3	64.5	64.6
Vehicle Noise:	68.3	65.7	63.7	62.4	69.4	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	126	271	584
CNEL:	61	132	284	612

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: s/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.45	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-16.78	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.74	-1.08	-1.20	-5.31	0.000	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	64.6	63.3	57.3	65.7	66.3
Medium Trucks:	60.4	56.5	49.0	57.7	63.9	63.9
Heavy Trucks:	61.2	57.2	53.8	58.4	64.6	64.7
Vehicle Noise:	68.5	65.9	63.9	62.6	69.6	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	60	129	279	600
CNEL:	63	136	292	629

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Craig Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	300 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-6.34	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-21.20	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-18.99	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.1	54.2	52.8	46.8	55.3	55.9
Medium Trucks:	52.7	48.8	41.0	50.2	56.3	56.4
Heavy Trucks:	60.8	56.8	49.0	58.2	64.4	64.4
Vehicle Noise:	62.5	59.1	54.5	59.1	65.5	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	63	136	294
CNEL:	30	64	138	298

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Garbani Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	320 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.02	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-22.89	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.67	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.9	60.0	58.6	52.6	61.1	61.7
Medium Trucks:	57.7	53.7	46.0	55.2	61.3	61.4
Heavy Trucks:	63.9	59.9	52.2	61.4	67.5	67.6
Vehicle Noise:	66.7	63.5	59.7	62.7	69.2	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	112	242	521
CNEL:	53	114	247	531

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	760 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.26	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.13	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-16.91	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.7	63.8	62.4	56.4	64.8	65.5
Medium Trucks:	61.5	57.5	49.7	58.9	65.1	65.1
Heavy Trucks:	67.7	63.7	55.9	65.1	71.3	71.3
Vehicle Noise:	70.4	67.2	63.5	66.5	72.9	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	93	200	430	927
CNEL:	95	204	439	946

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,040 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.78	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-19.02	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-22.97	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.9	62.8	61.5	55.5	63.9	64.6
Medium Trucks:	58.6	54.7	47.2	56.0	62.2	62.2
Heavy Trucks:	59.5	55.4	52.0	56.7	62.9	63.0
Vehicle Noise:	66.7	64.1	62.1	60.9	67.8	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	91	196	423
CNEL:	44	95	206	443

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: e/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,050 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.74	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-18.98	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-22.93	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.9	62.9	61.6	55.6	64.0	64.6
Medium Trucks:	58.7	54.8	47.3	56.0	62.2	62.2
Heavy Trucks:	59.5	55.5	52.1	56.7	62.9	63.0
Vehicle Noise:	66.7	64.1	62.2	60.9	67.9	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	92	197	425
CNEL:	45	96	207	446

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,632 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	163 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.82	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-27.06	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-31.02	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.8	54.8	53.5	47.5	55.9	56.5
Medium Trucks:	50.6	46.7	39.2	47.9	54.1	54.1
Heavy Trucks:	51.4	47.4	44.0	48.6	54.8	54.9
Vehicle Noise:	58.7	56.1	54.1	52.8	59.8	60.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	26	57	123
CNEL:	13	28	60	129

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	832 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	83 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-13.00	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-27.87	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.65	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.6	51.7	50.3	44.3	52.8	53.4
Medium Trucks:	49.8	45.8	38.0	47.2	53.4	53.4
Heavy Trucks:	56.8	52.8	45.0	54.3	60.4	60.4
Vehicle Noise:	59.1	55.8	51.7	55.4	61.8	61.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	17	36	77	167
CNEL:	17	37	79	170

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,140 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.90	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-16.34	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-20.30	-1.84	-1.20	-5.25	0.000	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	64.7	58.7	67.1	67.8
Medium Trucks:	61.6	57.7	50.2	59.0	65.1	65.2
Heavy Trucks:	62.0	58.0	54.6	59.2	65.4	65.5
Vehicle Noise:	69.7	67.2	65.3	63.8	70.8	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	85	184	397	855
CNEL:	90	193	417	898

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,580 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	3.13	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-14.11	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-18.06	-1.84	-1.20	-5.25	0.000	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	68.3	67.0	60.9	69.4	70.0
Medium Trucks:	63.9	60.0	52.5	61.2	67.4	67.4
Heavy Trucks:	64.3	60.2	56.8	61.5	67.7	67.8
Vehicle Noise:	72.0	69.4	67.5	66.0	73.0	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	120	260	559	1,205
CNEL:	127	273	587	1,265

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,170	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	2.19	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-15.05	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-19.01	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.9	68.9	67.6	61.6	70.0	70.6
Medium Trucks:	64.3	60.4	52.9	61.7	67.8	67.9
Heavy Trucks:	64.3	60.3	56.9	61.6	67.8	67.8
Vehicle Noise:	72.5	70.0	68.1	66.4	73.4	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	129	277	597	1,287
CNEL:	135	292	628	1,354

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,780	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.62	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-15.62	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-19.58	-1.84	-1.20	-5.25	0.000	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	68.3	67.0	61.0	69.4	70.1
Medium Trucks:	63.7	59.8	52.3	61.1	67.3	67.3
Heavy Trucks:	63.8	59.7	56.3	61.0	67.2	67.3
Vehicle Noise:	71.9	69.4	67.5	65.8	72.9	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	118	254	547	1,179
CNEL:	124	267	576	1,240

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,350	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.89	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-16.35	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.31	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.6	66.3	60.3	68.7	69.3
Medium Trucks:	63.0	59.1	51.6	60.4	66.5	66.6
Heavy Trucks:	63.0	59.0	55.6	60.3	66.5	66.5
Vehicle Noise:	71.2	68.7	66.8	65.1	72.1	72.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	105	227	489	1,054
CNEL:	111	239	515	1,109

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,300	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.93	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-16.80	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.58	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.8	64.9	63.5	57.5	65.9	66.5
Medium Trucks:	62.6	58.6	50.8	60.0	66.2	66.2
Heavy Trucks:	68.8	64.8	57.0	66.2	72.4	72.4
Vehicle Noise:	71.5	68.3	64.6	67.6	74.0	74.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	141	304	656	1,412
CNEL:	144	310	669	1,441

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Haun Rd. | Job Number: 11304
Road Segment: n/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,280 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.17	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-16.07	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-20.02	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.5	66.2	60.2	68.6	69.3
Medium Trucks:	63.1	59.2	51.7	60.5	66.7	66.7
Heavy Trucks:	63.6	59.5	56.1	60.8	67.0	67.1
Vehicle Noise:	71.3	68.7	66.8	65.3	72.3	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	180	389	837
CNEL:	88	189	408	879

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Zeiders Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	730 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.78	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-21.01	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-24.97	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.6	62.6	61.3	55.3	63.7	64.3
Medium Trucks:	58.2	54.3	46.8	55.5	61.7	61.7
Heavy Trucks:	58.6	54.6	51.2	55.8	62.0	62.1
Vehicle Noise:	66.3	63.8	61.8	60.3	67.3	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	84	182	392
CNEL:	41	89	191	411

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Antelope Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,870 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.31	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-16.93	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-20.88	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.7	66.7	65.4	59.4	67.8	68.4
Medium Trucks:	62.3	58.4	50.9	59.6	65.8	65.8
Heavy Trucks:	62.7	58.6	55.3	59.9	66.1	66.2
Vehicle Noise:	70.4	67.8	65.9	64.4	71.4	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	158	340	734
CNEL:	77	166	358	770

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: n/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,710 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.38	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-16.86	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.82	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.5	64.5	63.2	57.2	65.6	66.3
Medium Trucks:	60.3	56.4	48.9	57.7	63.8	63.9
Heavy Trucks:	61.2	57.1	53.7	58.4	64.6	64.7
Vehicle Noise:	68.4	65.8	63.8	62.5	69.5	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	128	275	593
CNEL:	62	134	289	622

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Menifee Rd. | Job Number: 11304
Road Segment: s/o Holland Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,760 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	58.241
Medium Trucks:	58.089
Heavy Trucks:	58.104

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.50	-1.10	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-16.73	-1.08	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.69	-1.08	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.7	64.7	63.3	57.3	65.8	66.4
Medium Trucks:	60.4	56.5	49.0	57.8	64.0	64.0
Heavy Trucks:	61.3	57.2	53.8	58.5	64.7	64.8
Vehicle Noise:	68.5	65.9	63.9	62.7	69.6	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	60	130	281	605
CNEL:	63	137	294	634

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Craig Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	760 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-2.30	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-17.17	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-14.95	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.2	58.3	56.9	50.9	59.3	59.9
Medium Trucks:	56.8	52.8	45.0	54.2	60.4	60.4
Heavy Trucks:	64.8	60.8	53.1	62.3	68.4	68.5
Vehicle Noise:	66.6	63.2	58.6	63.2	69.5	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	253	546
CNEL:	55	119	257	554

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Garbani Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	780 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.15	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.02	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-16.80	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.8	63.9	62.5	56.5	64.9	65.6
Medium Trucks:	61.6	57.6	49.8	59.0	65.2	65.2
Heavy Trucks:	67.8	63.8	56.0	65.2	71.4	71.4
Vehicle Noise:	70.5	67.4	63.6	66.6	73.1	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	94	203	438	943
CNEL:	96	207	447	962

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Leon Rd. | Job Number: 11304
Road Segment: s/o Scott Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	810 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.99	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-18.85	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-16.63	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.0	64.1	62.7	56.6	65.1	65.7
Medium Trucks:	61.8	57.8	50.0	59.2	65.4	65.4
Heavy Trucks:	68.0	64.0	56.2	65.4	71.6	71.6
Vehicle Noise:	70.7	67.5	63.7	66.8	73.2	73.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	97	208	449	967
CNEL:	99	213	458	987

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,050	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.74	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-18.98	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-22.93	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.9	62.9	61.6	55.6	64.0	64.6
Medium Trucks:	58.7	54.8	47.3	56.0	62.2	62.2
Heavy Trucks:	59.5	55.5	52.1	56.7	62.9	63.0
Vehicle Noise:	66.7	64.1	62.2	60.9	67.9	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	92	197	425
CNEL:	45	96	207	446

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: e/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,130	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.42	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-18.66	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-22.61	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.2	63.2	61.9	55.9	64.3	64.9
Medium Trucks:	59.0	55.1	47.6	56.3	62.5	62.6
Heavy Trucks:	59.8	55.8	52.4	57.0	63.2	63.3
Vehicle Noise:	67.1	64.5	62.5	61.2	68.2	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	96	207	447
CNEL:	47	101	217	468

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	250	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-7.97	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-25.21	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-29.17	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.7	56.7	55.3	49.3	57.8	58.4
Medium Trucks:	52.4	48.5	41.0	49.8	56.0	56.0
Heavy Trucks:	53.3	49.2	45.8	50.5	56.7	56.8
Vehicle Noise:	60.5	57.9	56.0	54.7	61.6	61.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	35	76	163
CNEL:	17	37	79	171

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Holland Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	170	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.90	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-24.76	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-22.54	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	54.8	53.4	47.4	55.9	56.5
Medium Trucks:	52.9	48.9	41.1	50.3	56.5	56.5
Heavy Trucks:	59.9	55.9	48.1	57.4	63.5	63.5
Vehicle Noise:	62.2	58.9	54.8	58.5	64.9	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	58	125	269
CNEL:	27	59	127	274

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,180	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.98	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-16.26	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-20.22	-1.84	-1.20	-5.25	0.000	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	66.1	64.8	58.8	67.2	67.8
Medium Trucks:	61.7	57.8	50.3	59.0	65.2	65.3
Heavy Trucks:	62.1	58.1	54.7	59.3	65.5	65.6
Vehicle Noise:	69.8	67.3	65.3	63.8	70.8	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	87	186	402	866
CNEL:	91	196	422	909

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Haun Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	36,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,680	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	3.25	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-13.99	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-17.94	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.4	68.4	67.1	61.1	69.5	70.1
Medium Trucks:	64.0	60.1	52.6	61.3	67.5	67.5
Heavy Trucks:	64.4	60.3	57.0	61.6	67.8	67.9
Vehicle Noise:	72.1	69.5	67.6	66.1	73.1	73.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	123	264	570	1,227
CNEL:	129	278	598	1,289

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Menifee Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,540	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	2.67	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-14.57	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.53	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.4	69.4	68.1	62.1	70.5	71.1
Medium Trucks:	64.8	60.9	53.4	62.1	68.3	68.4
Heavy Trucks:	64.8	60.8	57.4	62.0	68.2	68.3
Vehicle Noise:	73.0	70.5	68.6	66.9	73.9	74.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	139	298	643	1,385
CNEL:	146	314	676	1,457

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Briggs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,160	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	2.17	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-15.06	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-19.02	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.9	68.9	67.6	61.6	70.0	70.6
Medium Trucks:	64.3	60.4	52.9	61.7	67.8	67.9
Heavy Trucks:	64.3	60.3	56.9	61.5	67.7	67.8
Vehicle Noise:	72.5	70.0	68.1	66.4	73.4	73.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	128	277	596	1,284
CNEL:	135	291	627	1,351

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: w/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,720	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.52	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-15.72	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-19.67	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.2	68.2	66.9	60.9	69.3	70.0
Medium Trucks:	63.6	59.7	52.2	61.0	67.2	67.2
Heavy Trucks:	63.7	59.6	56.2	60.9	67.1	67.2
Vehicle Noise:	71.8	69.3	67.4	65.7	72.8	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	116	250	539	1,162
CNEL:	122	263	567	1,222

Tuesday, March 06, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP 2021 | Project Name: Canterwood
Road Name: Scott Rd. | Job Number: 11304
Road Segment: e/o Leon Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,340	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.80	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	82.40	-16.67	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.45	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.9	65.0	63.6	57.6	66.1	66.7
Medium Trucks:	62.7	58.7	50.9	60.1	66.3	66.3
Heavy Trucks:	68.9	64.9	57.1	66.4	72.5	72.5
Vehicle Noise:	71.6	68.5	64.7	67.7	74.2	74.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	144	310	669	1,441
CNEL:	147	317	682	1,470

Tuesday, March 06, 2018

APPENDIX 8.1:

ON-SITE TRAFFIC NOISE CALCULATIONS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Backyard With Wall
Road Name: Holland Rd.
Lot No: 38

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,730	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	78.0	feet
Barrier Distance to Observer:	10.0	feet
Observer Height (Above Pad):	3.0	feet
Pad Elevation:	42.3	feet
Road Elevation:	42.3	feet
Barrier Elevation:	43.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	42.300		
Medium Trucks:	44.597		
Heavy Trucks:	50.306	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	75.726
Medium Trucks:	75.456
Heavy Trucks:	75.138

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.67	-1.87	0.00	*1.96*	-12.220	-15.220
Medium Trucks:	76.31	-12.19	-1.86	0.00	*1.77*	-11.840	-14.840
Heavy Trucks:	81.16	-9.97	-1.84	0.00	*1.32*	-10.940	-13.940

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.2	66.1	64.9	58.8	67.2	67.9
Medium Trucks:	62.3	58.3	50.5	59.7	65.9	65.9
Heavy Trucks:	69.3	65.4	57.6	66.8	72.9	73.0
Vehicle Noise:	72.3	69.2	65.7	68.1	74.6	74.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.9	53.9	52.6	46.6	55.0	55.7
Medium Trucks:	50.4	46.4	38.7	47.9	54.0	54.1
Heavy Trucks:	58.4	54.4	46.6	55.9	62.0	62.0
Vehicle Noise:	60.8	57.5	53.7	56.9	63.3	63.5

Centerline Distance to Noise Contour (in feet)	*70 dBA*	*65 dBA*	*60 dBA*	*55 dBA*
CNEL:	233	737	2,332	7,374

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Backyard With Wall
Road Name: Holland Rd.
Lot No: 146

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,730	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	78.0	feet
Barrier Distance to Observer:	10.0	feet
Observer Height (Above Pad):	3.0	feet
Pad Elevation:	45.2	feet
Road Elevation:	47.5	feet
Barrier Elevation:	45.2	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	47.500		
Medium Trucks:	49.797		
Heavy Trucks:	55.506	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	75.059
Medium Trucks:	74.895
Heavy Trucks:	74.846

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.67	-1.83	0.00	*1.39*	-11.080	-14.080
Medium Trucks:	76.31	-12.19	-1.82	0.00	*1.22*	-10.740	-13.740
Heavy Trucks:	81.16	-9.97	-1.82	0.00	*0.86*	-9.880	-12.880

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.2	66.2	64.9	58.9	67.3	67.9
Medium Trucks:	62.3	58.3	50.5	59.7	65.9	65.9
Heavy Trucks:	69.4	65.4	57.6	66.8	73.0	73.0
Vehicle Noise:	72.3	69.2	65.8	68.1	74.6	74.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	57.1	55.1	53.8	47.8	56.2	56.8
Medium Trucks:	51.6	47.6	39.8	49.0	55.2	55.2
Heavy Trucks:	59.5	55.5	47.7	56.9	63.1	63.1
Vehicle Noise:	61.9	58.7	54.9	58.0	64.4	64.6

Centerline Distance to Noise Contour (in feet)	*70 dBA*	*65 dBA*	*60 dBA*	*55 dBA*
CNEL:	234	741	2,344	7,414

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Backyard With Wall
Road Name: Leon Rd.
Lot No: 29

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	58	feet

Site Data

Barrier Height:	**6.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	185.0	feet
Centerline Dist. to Observer:	195.0	feet
Barrier Distance to Observer:	10.0	feet
Observer Height (Above Pad):	3.0	feet
Pad Elevation:	41.7	feet
Road Elevation:	42.9	feet
Barrier Elevation:	41.7	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	42.900		
Medium Trucks:	45.197		
Heavy Trucks:	50.906	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	193.216
Medium Trucks:	193.170
Heavy Trucks:	193.181

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.89	-5.94	0.00	*0.48*	-8.400	-11.400
Medium Trucks:	76.31	-11.98	-5.94	0.00	*0.45*	-8.250	-11.250
Heavy Trucks:	81.16	-9.76	-5.94	0.00	*0.36*	-7.800	-10.800

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.3	62.3	61.0	55.0	63.4	64.0
Medium Trucks:	58.4	54.4	46.6	55.8	62.0	62.0
Heavy Trucks:	65.5	61.5	53.7	62.9	69.1	69.1
Vehicle Noise:	68.4	65.3	61.9	64.2	70.7	70.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.9	53.9	52.6	46.6	55.0	55.6
Medium Trucks:	50.1	46.2	38.4	47.6	53.7	53.8
Heavy Trucks:	57.7	53.7	45.9	55.1	61.3	61.3
Vehicle Noise:	60.3	57.2	53.6	56.3	62.8	62.9

Centerline Distance to Noise Contour (in feet)	*70 dBA*	*65 dBA*	*60 dBA*	*55 dBA*
CNEL:	239	755	2,389	7,554

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Backyard With Wall
Road Name: Leon Rd.
Lot No: 344

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	58	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	78.0	feet
Barrier Distance to Observer:	10.0	feet
Observer Height (Above Pad):	3.0	feet
Pad Elevation:	41.6	feet
Road Elevation:	40.0	feet
Barrier Elevation:	41.6	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	40.000		
Medium Trucks:	42.297		
Heavy Trucks:	48.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	73.431
Medium Trucks:	73.118
Heavy Trucks:	72.707

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.89	-1.74	0.00	*1.68*	-11.660	-14.660
Medium Trucks:	76.31	-11.98	-1.72	0.00	*1.50*	-11.300	-14.300
Heavy Trucks:	81.16	-9.76	-1.70	0.00	*1.10*	-10.500	-13.500

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	65.2	59.2	67.6	68.2
Medium Trucks:	62.6	58.6	50.9	60.1	66.2	66.3
Heavy Trucks:	69.7	65.7	57.9	67.2	73.3	73.3
Vehicle Noise:	72.6	69.5	66.1	68.5	75.0	75.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	56.9	54.8	53.5	47.5	55.9	56.6
Medium Trucks:	51.3	47.3	39.6	48.8	54.9	55.0
Heavy Trucks:	59.2	55.2	47.4	56.7	62.8	62.8
Vehicle Noise:	61.6	58.4	54.6	57.7	64.2	64.3

Centerline Distance to Noise Contour (in feet)	*70 dBA*	*65 dBA*	*60 dBA*	*55 dBA*
CNEL:	253	801	2,532	8,006

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Backyard With Wall
Road Name: Holland Rd.
Lot No: 38

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,730	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	78.0	feet
Barrier Distance to Observer:	10.0	feet
Observer Height (Above Pad):	3.0	feet
Pad Elevation:	42.3	feet
Road Elevation:	42.3	feet
Barrier Elevation:	43.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	42.300		
Medium Trucks:	44.597		
Heavy Trucks:	50.306	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	75.726
Medium Trucks:	75.456
Heavy Trucks:	75.138

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.67	-1.87	0.00	*1.96*	-12.220	-15.220
Medium Trucks:	76.31	-12.19	-1.86	0.00	*1.77*	-11.840	-14.840
Heavy Trucks:	81.16	-9.97	-1.84	0.00	*1.32*	-10.940	-13.940

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.2	66.1	64.9	58.8	67.2	67.9
Medium Trucks:	62.3	58.3	50.5	59.7	65.9	65.9
Heavy Trucks:	69.3	65.4	57.6	66.8	72.9	73.0
Vehicle Noise:	72.3	69.2	65.7	68.1	74.6	74.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.9	53.9	52.6	46.6	55.0	55.7
Medium Trucks:	50.4	46.4	38.7	47.9	54.0	54.1
Heavy Trucks:	58.4	54.4	46.6	55.9	62.0	62.0
Vehicle Noise:	60.8	57.5	53.7	56.9	63.3	63.5

Centerline Distance to Noise Contour (in feet)	*70 dBA*	*65 dBA*	*60 dBA*	*55 dBA*
CNEL:	233	737	2,332	7,374

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Backyard With Wall
Road Name: Holland Rd.
Lot No: 146

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,730	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	78.0	feet
Barrier Distance to Observer:	10.0	feet
Observer Height (Above Pad):	3.0	feet
Pad Elevation:	45.2	feet
Road Elevation:	47.5	feet
Barrier Elevation:	45.2	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	47.500		
Medium Trucks:	49.797		
Heavy Trucks:	55.506	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	75.059
Medium Trucks:	74.895
Heavy Trucks:	74.846

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.67	-1.83	0.00	*1.39*	-11.080	-14.080
Medium Trucks:	76.31	-12.19	-1.82	0.00	*1.22*	-10.740	-13.740
Heavy Trucks:	81.16	-9.97	-1.82	0.00	*0.86*	-9.880	-12.880

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.2	66.2	64.9	58.9	67.3	67.9
Medium Trucks:	62.3	58.3	50.5	59.7	65.9	65.9
Heavy Trucks:	69.4	65.4	57.6	66.8	73.0	73.0
Vehicle Noise:	72.3	69.2	65.8	68.1	74.6	74.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	57.1	55.1	53.8	47.8	56.2	56.8
Medium Trucks:	51.6	47.6	39.8	49.0	55.2	55.2
Heavy Trucks:	59.5	55.5	47.7	56.9	63.1	63.1
Vehicle Noise:	61.9	58.7	54.9	58.0	64.4	64.6

Centerline Distance to Noise Contour (in feet)	*70 dBA*	*65 dBA*	*60 dBA*	*55 dBA*
CNEL:	234	741	2,344	7,414

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Backyard With Wall
Road Name: Leon Rd.
Lot No: 29

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	58	feet

Site Data

Barrier Height:	**6.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	185.0	feet
Centerline Dist. to Observer:	195.0	feet
Barrier Distance to Observer:	10.0	feet
Observer Height (Above Pad):	3.0	feet
Pad Elevation:	41.7	feet
Road Elevation:	42.9	feet
Barrier Elevation:	41.7	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	42.900		
Medium Trucks:	45.197		
Heavy Trucks:	50.906	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	193.216
Medium Trucks:	193.170
Heavy Trucks:	193.181

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.89	-5.94	0.00	*0.48*	-8.400	-11.400
Medium Trucks:	76.31	-11.98	-5.94	0.00	*0.45*	-8.250	-11.250
Heavy Trucks:	81.16	-9.76	-5.94	0.00	*0.36*	-7.800	-10.800

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.3	62.3	61.0	55.0	63.4	64.0
Medium Trucks:	58.4	54.4	46.6	55.8	62.0	62.0
Heavy Trucks:	65.5	61.5	53.7	62.9	69.1	69.1
Vehicle Noise:	68.4	65.3	61.9	64.2	70.7	70.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.9	53.9	52.6	46.6	55.0	55.6
Medium Trucks:	50.1	46.2	38.4	47.6	53.7	53.8
Heavy Trucks:	57.7	53.7	45.9	55.1	61.3	61.3
Vehicle Noise:	60.3	57.2	53.6	56.3	62.8	62.9

Centerline Distance to Noise Contour (in feet)	*70 dBA*	*65 dBA*	*60 dBA*	*55 dBA*
CNEL:	239	755	2,389	7,554

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Backyard With Wall
Road Name: Leon Rd.
Lot No: 344

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	58	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	78.0	feet
Barrier Distance to Observer:	10.0	feet
Observer Height (Above Pad):	3.0	feet
Pad Elevation:	41.6	feet
Road Elevation:	40.0	feet
Barrier Elevation:	41.6	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	40.000		
Medium Trucks:	42.297		
Heavy Trucks:	48.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	73.431
Medium Trucks:	73.118
Heavy Trucks:	72.707

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.89	-1.74	0.00	*1.68*	-11.660	-14.660
Medium Trucks:	76.31	-11.98	-1.72	0.00	*1.50*	-11.300	-14.300
Heavy Trucks:	81.16	-9.76	-1.70	0.00	*1.10*	-10.500	-13.500

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	65.2	59.2	67.6	68.2
Medium Trucks:	62.6	58.6	50.9	60.1	66.2	66.3
Heavy Trucks:	69.7	65.7	57.9	67.2	73.3	73.3
Vehicle Noise:	72.6	69.5	66.1	68.5	75.0	75.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	56.9	54.8	53.5	47.5	55.9	56.6
Medium Trucks:	51.3	47.3	39.6	48.8	54.9	55.0
Heavy Trucks:	59.2	55.2	47.4	56.7	62.8	62.8
Vehicle Noise:	61.6	58.4	54.6	57.7	64.2	64.3

Centerline Distance to Noise Contour (in feet)	*70 dBA*	*65 dBA*	*60 dBA*	*55 dBA*
CNEL:	253	801	2,532	8,006

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: First Floor With Wall
Road Name: Eucalyptus Rd.
Lot No: 158

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**6.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	58.0	feet
Centerline Dist. to Observer:	78.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	44.5	feet
Road Elevation:	45.0	feet
Barrier Elevation:	45.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	45.000		
Medium Trucks:	47.297		
Heavy Trucks:	53.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	75.518
Medium Trucks:	75.317
Heavy Trucks:	75.229

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	1.72	-1.86	0.00	*0.23*	-7.010	-10.010
Medium Trucks:	76.31	-15.52	-1.85	0.00	*0.14*	-6.320	-9.320
Heavy Trucks:	81.16	-19.47	-1.84	0.00	*0.01*	-5.100	-8.100

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.2	65.2	63.9	57.9	66.3	66.9
Medium Trucks:	58.9	55.0	47.5	56.3	62.5	62.5
Heavy Trucks:	59.8	55.8	52.4	57.0	63.2	63.3
Vehicle Noise:	68.5	66.0	64.3	61.9	69.1	69.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.2	58.2	56.9	50.9	59.3	59.9
Medium Trucks:	52.6	48.7	41.2	50.0	56.2	56.2
Heavy Trucks:	54.7	50.7	47.3	51.9	58.1	58.2
Vehicle Noise:	61.8	59.3	57.4	55.8	62.8	63.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: First Floor With Wall
Road Name: Eucalyptus Rd.
Lot No: 472

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**6.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	187.0	feet
Centerline Dist. to Observer:	207.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	40.7	feet
Road Elevation:	42.0	feet
Barrier Elevation:	40.7	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	42.000		
Medium Trucks:	44.297		
Heavy Trucks:	50.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	206.216
Medium Trucks:	206.172
Heavy Trucks:	206.186

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	1.72	-6.22	0.00	*0.05*	-5.500	-8.500
Medium Trucks:	76.31	-15.52	-6.22	0.00	*0.03*	-5.300	-8.300
Heavy Trucks:	81.16	-19.47	-6.22	0.00	*0.01*	-5.100	-8.100

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	62.9	60.8	59.5	53.5	61.9	62.6
Medium Trucks:	54.6	50.7	43.2	51.9	58.1	58.1
Heavy Trucks:	55.5	51.4	48.0	52.7	58.9	59.0
Vehicle Noise:	64.1	61.7	59.9	57.5	64.7	65.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	57.4	55.3	54.0	48.0	56.4	57.1
Medium Trucks:	49.3	45.4	37.9	46.6	52.8	52.8
Heavy Trucks:	50.4	46.3	42.9	47.6	53.8	53.9
Vehicle Noise:	58.7	56.2	54.5	52.2	59.4	59.8

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: First Floor With Wall
Road Name: Craig. Av.
Lot No: 350

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**6.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	58.0	feet
Centerline Dist. to Observer:	78.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	40.8	feet
Road Elevation:	39.5	feet
Barrier Elevation:	40.8	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	39.500		
Medium Trucks:	41.797		
Heavy Trucks:	47.506	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	75.642
Medium Trucks:	75.388
Heavy Trucks:	75.166

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	1.72	-1.87	0.00	*0.22*	-6.940	-9.940
Medium Trucks:	76.31	-15.52	-1.85	0.00	*0.13*	-6.240	-9.240
Heavy Trucks:	81.16	-19.47	-1.84	0.00	*0.01*	-5.100	-8.100

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.2	65.2	63.9	57.9	66.3	66.9
Medium Trucks:	58.9	55.0	47.5	56.3	62.5	62.5
Heavy Trucks:	59.8	55.8	52.4	57.1	63.3	63.3
Vehicle Noise:	68.5	66.0	64.3	61.9	69.1	69.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.3	58.3	57.0	50.9	59.4	60.0
Medium Trucks:	52.7	48.8	41.3	50.1	56.2	56.3
Heavy Trucks:	54.7	50.7	47.3	52.0	58.2	58.2
Vehicle Noise:	61.9	59.4	57.5	55.8	62.9	63.2

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: First Floor With Wall
Road Name: Craig. Av.
Lot No: 564

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**6.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	79.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	41.7	feet
Road Elevation:	41.0	feet
Barrier Elevation:	41.7	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	41.000		
Medium Trucks:	43.297		
Heavy Trucks:	49.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.610
Medium Trucks:	76.384
Heavy Trucks:	76.227

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	1.72	-1.92	0.00	*0.19*	-6.720	-9.720
Medium Trucks:	76.31	-15.52	-1.91	0.00	*0.11*	-6.080	-9.080
Heavy Trucks:	81.16	-19.47	-1.90	0.00	*0.01*	-5.100	-8.100

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.2	65.1	63.8	57.8	66.2	66.9
Medium Trucks:	58.9	55.0	47.5	56.2	62.4	62.4
Heavy Trucks:	59.8	55.7	52.3	57.0	63.2	63.3
Vehicle Noise:	68.4	66.0	64.2	61.8	69.1	69.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.4	58.4	57.1	51.1	59.5	60.1
Medium Trucks:	52.8	48.9	41.4	50.2	56.3	56.4
Heavy Trucks:	54.7	50.6	47.2	51.9	58.1	58.2
Vehicle Noise:	62.0	59.5	57.6	55.9	62.9	63.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: First Floor With Wall
Road Name: Holland Rd.
Lot No: 38

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,730	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	88.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	42.3	feet
Road Elevation:	42.3	feet
Barrier Elevation:	43.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	42.300		
Medium Trucks:	44.597		
Heavy Trucks:	50.306	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	84.555
Medium Trucks:	84.285
Heavy Trucks:	83.967

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.67	-2.35	0.00	*0.74*	-9.460	-12.460
Medium Trucks:	76.31	-12.19	-2.34	0.00	*0.59*	-8.950	-11.950
Heavy Trucks:	81.16	-9.97	-2.32	0.00	*0.29*	-7.430	-10.430

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.7	65.7	64.4	58.4	66.8	67.4
Medium Trucks:	61.8	57.8	50.0	59.2	65.4	65.4
Heavy Trucks:	68.9	64.9	57.1	66.3	72.5	72.5
Vehicle Noise:	71.8	68.7	65.3	67.6	74.1	74.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.2	56.2	54.9	48.9	57.3	57.9
Medium Trucks:	52.8	48.9	41.1	50.3	56.4	56.5
Heavy Trucks:	61.4	57.5	49.7	58.9	65.0	65.1
Vehicle Noise:	63.5	60.2	56.2	59.8	66.2	66.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: First Floor With Wall
Road Name: Holland Rd.
Lot No: 146

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,730	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	88.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	45.2	feet
Road Elevation:	47.5	feet
Barrier Elevation:	45.2	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	47.500		
Medium Trucks:	49.797		
Heavy Trucks:	55.506	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	84.102
Medium Trucks:	83.939
Heavy Trucks:	83.889

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.67	-2.33	0.00	*0.41*	-8.050	-11.050
Medium Trucks:	76.31	-12.19	-2.32	0.00	*0.30*	-7.500	-10.500
Heavy Trucks:	81.16	-9.97	-2.32	0.00	*0.10*	-6.000	-9.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.7	65.7	64.4	58.4	66.8	67.4
Medium Trucks:	61.8	57.8	50.0	59.2	65.4	65.4
Heavy Trucks:	68.9	64.9	57.1	66.3	72.5	72.5
Vehicle Noise:	71.8	68.7	65.3	67.6	74.1	74.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.7	57.6	56.3	50.3	58.7	59.4
Medium Trucks:	54.3	50.3	42.5	51.7	57.9	57.9
Heavy Trucks:	62.9	58.9	51.1	60.3	66.5	66.5
Vehicle Noise:	65.0	61.7	57.6	61.2	67.6	67.8

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: First Floor With Wall
Road Name: Leon Rd.
Lot No: 29

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	58	feet

Site Data

Barrier Height:	**6.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	185.0	feet
Centerline Dist. to Observer:	205.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	41.7	feet
Road Elevation:	42.9	feet
Barrier Elevation:	41.7	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	42.900		
Medium Trucks:	45.197		
Heavy Trucks:	50.906	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	202.801
Medium Trucks:	202.755
Heavy Trucks:	202.766

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.89	-6.15	0.00	*0.05*	-5.500	-8.500
Medium Trucks:	76.31	-11.98	-6.15	0.00	*0.04*	-5.400	-8.400
Heavy Trucks:	81.16	-9.76	-6.15	0.00	*0.01*	-5.100	-8.100

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.1	62.1	60.8	54.8	63.2	63.8
Medium Trucks:	58.2	54.2	46.4	55.6	61.8	61.8
Heavy Trucks:	65.3	61.3	53.5	62.7	68.9	68.9
Vehicle Noise:	68.2	65.1	61.7	64.0	70.5	70.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.6	56.6	55.3	49.3	57.7	58.3
Medium Trucks:	52.8	48.8	41.0	50.2	56.4	56.4
Heavy Trucks:	60.2	56.2	48.4	57.6	63.8	63.8
Vehicle Noise:	62.9	59.8	56.2	58.8	65.3	65.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: First Floor With Wall
Road Name: Leon Rd.
Lot No: 344

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	58	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	88.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	41.6	feet
Road Elevation:	40.0	feet
Barrier Elevation:	41.6	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	40.000		
Medium Trucks:	42.297		
Heavy Trucks:	48.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	82.475
Medium Trucks:	82.162
Heavy Trucks:	81.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.89	-2.24	0.00	*0.64*	-9.120	-12.120
Medium Trucks:	76.31	-11.98	-2.23	0.00	*0.50*	-8.500	-11.500
Heavy Trucks:	81.16	-9.76	-2.20	0.00	*0.23*	-7.010	-10.010

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	64.7	58.7	67.1	67.7
Medium Trucks:	62.1	58.1	50.3	59.6	65.7	65.7
Heavy Trucks:	69.2	65.2	57.4	66.6	72.8	72.8
Vehicle Noise:	72.1	69.0	65.6	68.0	74.5	74.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.9	56.9	55.6	49.6	58.0	58.6
Medium Trucks:	53.6	49.6	41.8	51.1	57.2	57.2
Heavy Trucks:	62.2	58.2	50.4	59.6	65.8	65.8
Vehicle Noise:	64.2	60.9	56.9	60.6	66.9	67.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Second Floor With Wall
Road Name: Eucalyptus Rd.
Lot No: 158

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**6.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	58.0	feet
Centerline Dist. to Observer:	78.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	44.5	feet
Road Elevation:	45.0	feet
Barrier Elevation:	45.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	45.000		
Medium Trucks:	47.297		
Heavy Trucks:	53.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	77.086
Medium Trucks:	76.717
Heavy Trucks:	76.093

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	1.72	-1.95	0.00	*-0.50*	0.000	0.000
Medium Trucks:	76.31	-15.52	-1.93	0.00	*-0.66*	0.000	0.000
Heavy Trucks:	81.16	-19.47	-1.89	0.00	*-1.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.1	65.1	63.8	57.8	66.2	66.8
Medium Trucks:	58.9	55.0	47.5	56.2	62.4	62.4
Heavy Trucks:	59.8	55.7	52.4	57.0	63.2	63.3
Vehicle Noise:	68.4	66.0	64.2	61.8	69.0	69.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.1	65.1	63.8	57.8	66.2	66.8
Medium Trucks:	58.9	55.0	47.5	56.2	62.4	62.4
Heavy Trucks:	59.8	55.7	52.4	57.0	63.2	63.3
Vehicle Noise:	68.4	66.0	64.2	61.8	69.0	69.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Second Floor With Wall
Road Name: Eucalyptus Rd.
Lot No: 472

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,070 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	187.0 feet
Centerline Dist. to Observer:	207.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	40.7 feet
Road Elevation:	42.0 feet
Barrier Elevation:	40.7 feet
Road Grade:	0.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	42.000		
Medium Trucks:	44.297		
Heavy Trucks:	50.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	206.607
Medium Trucks:	206.478
Heavy Trucks:	206.269

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	1.72	-6.23	0.00	*-1.18*	0.000	0.000
Medium Trucks:	76.31	-15.52	-6.23	0.00	*-1.27*	0.000	0.000
Heavy Trucks:	81.16	-19.47	-6.22	0.00	*-1.48*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	62.8	60.8	59.5	53.5	61.9	62.6
Medium Trucks:	54.6	50.7	43.2	51.9	58.1	58.1
Heavy Trucks:	55.5	51.4	48.0	52.7	58.9	59.0
Vehicle Noise:	64.1	61.7	59.9	57.5	64.7	65.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	62.8	60.8	59.5	53.5	61.9	62.6
Medium Trucks:	54.6	50.7	43.2	51.9	58.1	58.1
Heavy Trucks:	55.5	51.4	48.0	52.7	58.9	59.0
Vehicle Noise:	64.1	61.7	59.9	57.5	64.7	65.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Second Floor With Wall
Road Name: Craig. Av.
Lot No: 350

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**6.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	58.0	feet
Centerline Dist. to Observer:	78.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	40.8	feet
Road Elevation:	39.5	feet
Barrier Elevation:	40.8	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	39.500		
Medium Trucks:	41.797		
Heavy Trucks:	47.506	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	77.422
Medium Trucks:	77.001
Heavy Trucks:	76.244

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	1.72	-1.97	0.00	*-0.50*	0.000	0.000
Medium Trucks:	76.31	-15.52	-1.94	0.00	*-0.66*	0.000	0.000
Heavy Trucks:	81.16	-19.47	-1.90	0.00	*-1.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.1	65.1	63.8	57.8	66.2	66.8
Medium Trucks:	58.9	55.0	47.5	56.2	62.4	62.4
Heavy Trucks:	59.8	55.7	52.3	57.0	63.2	63.3
Vehicle Noise:	68.4	65.9	64.2	61.8	69.0	69.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.1	65.1	63.8	57.8	66.2	66.8
Medium Trucks:	58.9	55.0	47.5	56.2	62.4	62.4
Heavy Trucks:	59.8	55.7	52.3	57.0	63.2	63.3
Vehicle Noise:	68.4	65.9	64.2	61.8	69.0	69.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Second Floor With Wall
Road Name: Craig. Av.
Lot No: 564

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**6.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	79.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	41.7	feet
Road Elevation:	41.0	feet
Barrier Elevation:	41.7	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	41.000		
Medium Trucks:	43.297		
Heavy Trucks:	49.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	78.314
Medium Trucks:	77.916
Heavy Trucks:	77.213

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	1.72	-2.02	0.00	*-0.55*	0.000	0.000
Medium Trucks:	76.31	-15.52	-2.00	0.00	*-0.72*	0.000	0.000
Heavy Trucks:	81.16	-19.47	-1.96	0.00	*-1.24*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.1	65.1	63.7	57.7	66.1	66.8
Medium Trucks:	58.8	54.9	47.4	56.2	62.3	62.4
Heavy Trucks:	59.7	55.7	52.3	56.9	63.1	63.2
Vehicle Noise:	68.3	65.9	64.1	61.8	69.0	69.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.1	65.1	63.7	57.7	66.1	66.8
Medium Trucks:	58.8	54.9	47.4	56.2	62.3	62.4
Heavy Trucks:	59.7	55.7	52.3	56.9	63.1	63.2
Vehicle Noise:	68.3	65.9	64.1	61.8	69.0	69.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Second Floor With Wall
Road Name: Holland Rd.
Lot No: 38

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,730	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	88.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	42.3	feet
Road Elevation:	42.3	feet
Barrier Elevation:	43.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	42.300		
Medium Trucks:	44.597		
Heavy Trucks:	50.306	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	85.814
Medium Trucks:	85.469
Heavy Trucks:	84.876

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.67	-2.41	0.00	*-0.13*	0.000	0.000
Medium Trucks:	76.31	-12.19	-2.40	0.00	*-0.21*	0.000	0.000
Heavy Trucks:	81.16	-9.97	-2.37	0.00	*-0.48*	0.000	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	64.3	58.3	66.7	67.3
Medium Trucks:	61.7	57.7	50.0	59.2	65.3	65.4
Heavy Trucks:	68.8	64.8	57.1	66.3	72.4	72.5
Vehicle Noise:	71.7	68.6	65.2	67.6	74.1	74.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.6	65.6	64.3	58.3	66.7	67.3
Medium Trucks:	61.7	57.7	50.0	59.2	65.3	65.4
Heavy Trucks:	68.8	64.8	57.1	66.3	72.4	72.5
Vehicle Noise:	71.7	68.6	65.2	67.6	74.1	74.2

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Second Floor With Wall
Road Name: Holland Rd.
Lot No: 146

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,730	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	88.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	45.2	feet
Road Elevation:	47.5	feet
Barrier Elevation:	45.2	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	47.500		
Medium Trucks:	49.797		
Heavy Trucks:	55.506	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	85.469
Medium Trucks:	85.185
Heavy Trucks:	84.745

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.67	-2.40	0.00	*-0.34*	0.000	0.000
Medium Trucks:	76.31	-12.19	-2.38	0.00	*-0.45*	0.000	0.000
Heavy Trucks:	81.16	-9.97	-2.36	0.00	*-0.82*	0.000	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	64.3	58.3	66.7	67.4
Medium Trucks:	61.7	57.8	50.0	59.2	65.3	65.4
Heavy Trucks:	68.8	64.8	57.1	66.3	72.4	72.5
Vehicle Noise:	71.7	68.6	65.2	67.6	74.1	74.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.6	65.6	64.3	58.3	66.7	67.4
Medium Trucks:	61.7	57.8	50.0	59.2	65.3	65.4
Heavy Trucks:	68.8	64.8	57.1	66.3	72.4	72.5
Vehicle Noise:	71.7	68.6	65.2	67.6	74.1	74.2

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Second Floor With Wall
Road Name: Leon Rd.
Lot No: 29

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	58	feet

Site Data

Barrier Height:	**6.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	185.0	feet
Centerline Dist. to Observer:	205.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	41.7	feet
Road Elevation:	42.9	feet
Barrier Elevation:	41.7	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	42.900		
Medium Trucks:	45.197		
Heavy Trucks:	50.906	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	203.342
Medium Trucks:	203.210
Heavy Trucks:	202.995

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.89	-6.16	0.00	*-1.18*	0.000	0.000
Medium Trucks:	76.31	-11.98	-6.16	0.00	*-1.26*	0.000	0.000
Heavy Trucks:	81.16	-9.76	-6.15	0.00	*-1.48*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.1	62.1	60.8	54.8	63.2	63.8
Medium Trucks:	58.2	54.2	46.4	55.6	61.8	61.8
Heavy Trucks:	65.2	61.3	53.5	62.7	68.8	68.9
Vehicle Noise:	68.2	65.1	61.7	64.0	70.5	70.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.1	62.1	60.8	54.8	63.2	63.8
Medium Trucks:	58.2	54.2	46.4	55.6	61.8	61.8
Heavy Trucks:	65.2	61.3	53.5	62.7	68.8	68.9
Vehicle Noise:	68.2	65.1	61.7	64.0	70.5	70.7

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Second Floor With Wall
Road Name: Leon Rd.
Lot No: 344

Project Name: Canterwood
Job Number: 11304
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	58	feet

Site Data

Barrier Height:	**8.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	68.0	feet
Centerline Dist. to Observer:	88.0	feet
Barrier Distance to Observer:	20.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	41.6	feet
Road Elevation:	40.0	feet
Barrier Elevation:	41.6	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	75.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	40.000		
Medium Trucks:	42.297		
Heavy Trucks:	48.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	84.536
Medium Trucks:	84.143
Heavy Trucks:	83.431

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	2.89	-2.35	0.00	*-0.18*	0.000	0.000
Medium Trucks:	76.31	-11.98	-2.33	0.00	*-0.27*	0.000	0.000
Heavy Trucks:	81.16	-9.76	-2.29	0.00	*-0.56*	0.000	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	65.9	64.6	58.6	67.0	67.6
Medium Trucks:	62.0	58.0	50.2	59.5	65.6	65.6
Heavy Trucks:	69.1	65.1	57.3	66.6	72.7	72.7
Vehicle Noise:	72.0	68.9	65.5	67.9	74.4	74.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.9	65.9	64.6	58.6	67.0	67.6
Medium Trucks:	62.0	58.0	50.2	59.5	65.6	65.6
Heavy Trucks:	69.1	65.1	57.3	66.6	72.7	72.7
Vehicle Noise:	72.0	68.9	65.5	67.9	74.4	74.5