Appendix E
Noise Impact Analysis

Ave 43 / Calhoun St
Noise Impact Analysis
City of Indio

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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
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
mph	Miles per hour
PPV	Peak Particle Velocity
Project	Ave 43 / Calhoun St
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures, if any, for the proposed Ave 43 / Calhoun St development ("Project") located south of Avenue 43 and adjacent to Calhoun Street in the City of Indio. The Project consists of 1,200 multi-family dwelling units developed in two separate phases. Phase 1 will include the development of 340 multi-family units and Phase 2 will develop the reaming 860 multi-family units. This study has been prepared to satisfy applicable City of Indio standards and thresholds of significance based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

SUMMARY OF CEQA SIGNIFICANCE FINDINGS

The results of this Ave 43 / Calhoun St Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1). Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA before and after any required mitigation measures described below.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
On-Site Noise	7	*Significant*	*Less Than Significant*
Off-Site Traffic Noise	8	*Less Than Significant*	-
Operational Noise	10	*Significant*	*Less Than Significant*
Construction Noise	11	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

ON-SITE

This noise study evaluates the interior noise levels at the Project buildings in Phase 1 based on the City of Indio 45 dBA CNEL residential interior noise level standard. The Phase 1 buildings are shown to require a Noise Reduction (NR) of up to 27 dBA and a windows-closed condition requiring a means of mechanical ventilation (e.g. air conditioning). To meet the City of Indio 45 dBA CNEL interior noise standards the following measures are recommended:

- Windows: All buildings require standards windows and sliding glass doors with a minimum STC rating of 27 (all windows/glass doors, all floors), and a means of mechanical ventilation (e.g., air conditioning).
- 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.
- Residential Roofs: 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.

The building locations for Phase 2 are unknown. However, Phase 2 buildings along Avenue 43 and Calhoun Street are anticipated to be similar distances to these roadways as in Phase 1 and would have similar insulation requirements as Phase 1. Due to the lack of plans and the higher noise levels from Interstate 10 (I-10) traffic, only general recommendation can be provided for potential development along I-10. Therefore, Noise-1 is required for buildings located within 325 feet of Interstate 10 (I-10):

Noise 1: Prior to project approval and the issuance of a building permit and/or certificate of occupancy, the Project Applicant/Developer shall submit a final acoustical report to the City of Indio Planning Department, or designee. This analysis would finalize the STC ratings for windows and doors described in this study using the precise grading plans and actual building design specifications, and may include additional mitigation, if necessary, to meet the City of Indio 45 dBA CNEL interior noise level standard.

OFF-SITE

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 nine 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 *Ave 43 / Calhoun St Traffic Impact Analysis*. (2) To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for the existing and General Plan Buildout traffic conditions. Land uses along Calhoun Street will experience the highest Project related traffic noise level increases of 4.9 dBA CNEL. However, based on the existing ambient noise levels, the analysis shows that the Project-related traffic noise level increases will be *less than significant*.

OPERATIONAL

Unlike Phase 1 of the Project, Phase 2 has not been designed and building or lot layouts are not available. Phase 2 is anticipated to include potential noise sources that may impact the surrounding land uses. Therefore, measure Noise-2 requires best engineering practices to be used in the placement of noise generating equipment when developing site plans for HVAC units and activity areas, such that noise levels at the property line comply with County of Riverside County Code, Section 9.52.040. Development plans shall be accompanied by an acoustical analysis demonstrating compliance with County of Riverside County Code, Section 9.52.040 for approval prior to issuance of building permits.

Noise-2: Prior to the issuance of a building permit, the applicant, or its designee, will prepare an acoustical study(s) of proposed commercial land use site plans, which will identify all noise-generating areas and associated equipment, predict noise levels at property lines from all

identified areas, and recommended mitigation to be implemented (e.g., enclosures, barriers, site orientation, reduction of parking stalls), as necessary, to comply with the Riverside County Code, Section 9.52.040.

CONSTRUCTION NOISE ANALYSIS

Construction noise levels 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 the edge of primary Project construction activity. Using sample reference noise levels to represent the construction activities at the Project site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. The results of the analysis show the highest construction noise levels at the potentially impacted receiver locations are expected to approach 67.9 dBA L_{eq}.

The Project related construction equipment noise levels are anticipated to satisfy the reasonable construction noise level threshold of 80 dBA L_{eq} during typical Project construction activities at all receiver locations. Therefore, the short-term Project construction impacts are considered a *less than significant.*

CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. Project construction vibration velocity levels are expected to approach 0.027 in/sec PPV at the nearby receiver locations, and will therefore, not exceed the reasonable vibration threshold of 0.30 in/sec PPV at the nearest sensitive receivers. Therefore, construction related vibration impacts would be *less than significant*.

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Ave 43 / Calhoun St Development ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, sets out the local regulatory setting, presents the study methods and procedures for transportation related CNEL traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term stationary-source operational noise and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The proposed Ave 43 / Calhoun St Project is located south of Avenue 43 and east and west of Calhoun Street in the City of Indio, as shown on Exhibit 1-A. Existing nearby noise-sensitive residential uses are located southeast, east, and north of the Project site.

1.2 PROJECT DESCRIPTION

It is our understanding that the Project consists of 1,200 multi-family dwelling units developed in two separate phases. Phase 1 will include the development of 340 multi-family units and Phase 2 will develop the reaming 860 multi-family units, as shown on Exhibit 1-B. Phase 2 is currently in the initial design phase and building locations are not known. Per the *Ave 43 / Calhoun St Focused Traffic Analysis* prepared by Urban Crossroads, Inc. the Project is expected to generate a total of approximately 8,088 trip-ends per day. (2)

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN

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2 FUNDAMENTALS

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

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	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. (3) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 1,000 feet, which can cause serious discomfort. (4) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

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

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when noise can become more intrusive. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The City of Indio relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

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

2.3.1 GEOMETRIC SPREADING

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

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water),

no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (5)

2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (3)

2.3.4 SHIELDING

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

2.4 NOISE CONTROL

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

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must block the line-of-sight path of sound from the noise source.

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic

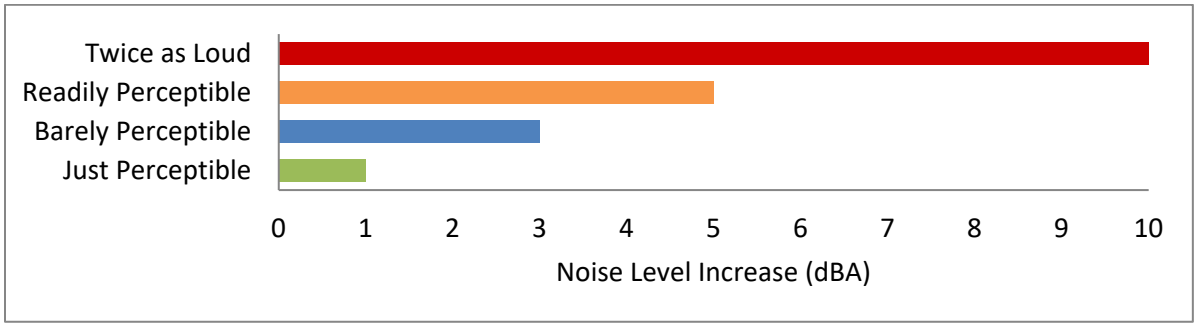
health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (6)

2.7 COMMUNITY RESPONSE TO NOISE

Approximately sixteen percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints may occur. Twenty to thirty percent of the population will not complain even in very severe noise environments. (7 pp. 8-6) Thus, a variety of reactions can be expected from people exposed to any given noise environment.

Surveys have shown that community response to noise varies from no reaction to vigorous action for newly introduced noises averaging from 10 dB below existing to 25 dB above existing. (8) According to research originally published in the Noise Effects Handbook (7), the percentage of high annoyance ranges from approximately 0 percent at 45 dB or less, 10 percent are highly annoyed around 60 dB, and increases rapidly to approximately 70 percent being highly annoyed at approximately 85 dB or greater. Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA is considered barely perceptible, and changes of 5 dBA are considered readily perceptible. (5)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual*, 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.

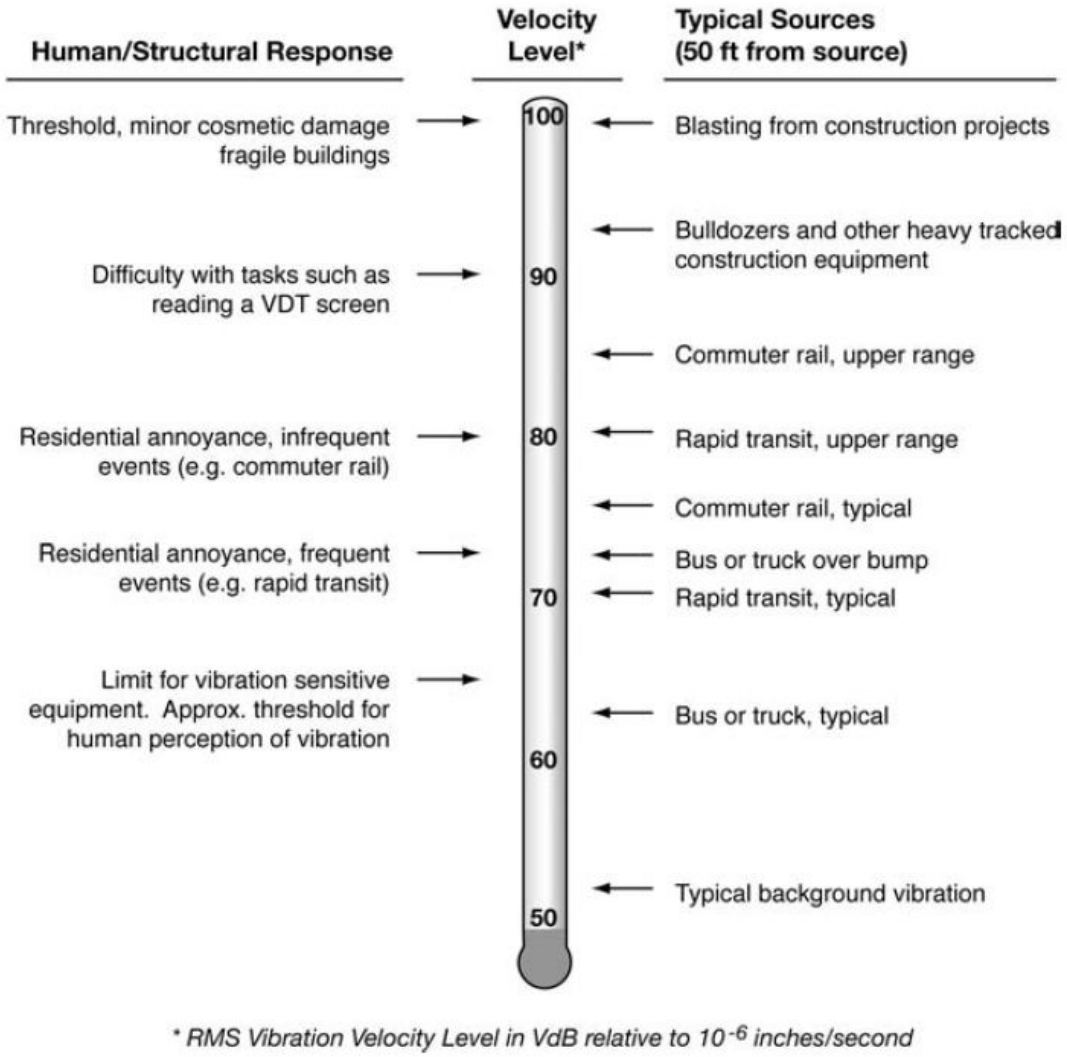
Additionally, in contrast to airborne noise, ground-borne vibration outdoors is not a common environmental problem and annoyance from ground-borne vibration is almost exclusively an indoor phenomenon (8). Therefore, the effects of vibrations should only be evaluated at a structure and the effects of the building structure on the vibration should be considered. Wood-frame buildings, such as typical residential structures, are more easily excited by ground vibration than heavier buildings. In contrast, large masonry buildings with spread footings have a low response to ground vibration (8). In general, the heavier a building is, the lower the response will be to the incident vibration energy. However, all structurers reduce vibration levels due to the coupling of the building to the soil.

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 (8). 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 (8). However, the RMS amplitude and PPV are related mathematically, and the RMS amplitude of equipment is typically calculated from the PPV reference level. The RMS amplitude is approximately 70% of the PPV (9). Thus, either can be used on the description of vibration impacts.

While not universally accepted, vibration decibel notation (VdB) is another vibration notation developed and used by the FTA in their guidance manual to describe vibration levels and provide a background of common vibration levels and set vibration limits (8). Decibel notation (VdB) serves to reduce the range of numbers used to describe vibration levels and is used in this report to describe vibration levels.

As stated in the FTA guidance manual, 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 and Vibration Impact Assessment Manual.

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 constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (10) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 STATE OF CALIFORNIA BUILDING CODE

The State of California's noise insulation standards for all residential units are codified in the California Code of Regulations (CCR), Title 24, Building Standards Administrative Code, Chapter 12, Section 1206. These noise standards are applied to new construction that contains dwelling units or sleeping units, such as residential and hotel or motel uses, in California for controlling interior noise levels resulting from exterior noise sources. For new buildings, the acceptable interior noise limit is 45 dBA CNEL in habitable rooms (11).

3.2 CITY OF INDIO GENERAL PLAN NOISE ELEMENT

The City of Indio has adopted a Noise Element of the General Plan to minimize exposure to excessive noise which can adversely affect physical and psychological well-being, property values, the environment, and quality of life. (12) As stated in Policy NE-1.2, the noise criteria identified in the City of Indio Noise Element (Table 11-1) are a "guide for planning and development decisions" when evaluating the land use compatibility of transportation-related noise. The compatibility criteria, shown on Exhibit 3-A, provides the City of Indio with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels. The following policies of the Noise Element are applicable to the Project:

NE-1.1 Sensitive receptors. Protect noise-sensitive uses, such as residences, schools, health care facilities, hotels, libraries, and churches, from excessive noise levels through land use capability / adjacency, build design, and noise ordinance enforcement.

EXHIBIT 3-A: NOISE AND LAND USE COMPATIBILITY MATRIX

Land Use Category		Exterior Noise Level (CNEL)						
		50	55	60	65	70	75	80
A	Residential – single family residences, mobile homes, senior housing, convalescent homes							
B	Residential – multi-family residences, mixed-use (commercial/residential)							
C	Transient lodging – motels, hotels, resorts							
D*	Schools, churches, hospitals, nursing homes, child care facilities							
E*	Passive recreational parks, nature preserves, contemplative spaces, cemeteries							
F*	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation							
G*	Office/professional, government, medical/dental, commercial, retail, laboratories							
H*	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair							

	ACCEPTABLE – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.
	CONDITIONALLY ACCEPTABLE – New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. Criteria for determining exterior and interior noise levels are listed in Table N-2, Noise Standards. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate county decision-maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.
	UNACCEPTABLE – New construction or development shall not be undertaken.

Source: City of Indio General Plan Noise Element, Table 11-1.

NE-1.2 Noise compatibility. Apply the Noise Compatibility Matrix, shown in Table 11-1, as a guide for planning and development decisions. The City will require projects involving new development or modifications to existing development to implement mitigation measures, where necessary, to reduce noise levels to at least the normally compatible range shown in the City's Noise Compatibility Matrix shown in Table 11-1. Mitigation measures should focus on architectural features and building design and construction, rather than site design features, such as excessive setbacks, berms, and sound walls, to maintain compatibility with adjacent and surrounding uses.

NE-1.3 Airport land use planning. Implement all applicable noise-related policies contained in the Bermuda Dunes Airport Land Use Plan.

The *Noise Compatibility Guidelines* describes categories of compatibility and not specific noise standards. The Ave 43 / Calhoun St multi-family residential land uses are considered *acceptable* with unmitigated exterior noise levels of less than 65 dBA CNEL, and *conditionally acceptable* exterior noise levels approaching 75 dBA CNEL, *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.* (12) Per Policy NE-1.2, "*mitigation measures should focus on architectural features and building design and construction, rather than site design features, such as excessive setbacks, berms, and sound walls, to maintain compatibility with adjacent and surrounding uses*."

3.3 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Ave 43 / Calhoun St Project, stationary-source (operational) noise such as the expected air conditioning units, outdoor activity areas, and pool activity are typically evaluated against standards established under a jurisdiction's Municipal Code or General Plan.

The City of Indio General Plan and Municipal Code do not identify stationary-source (operational) noise level standards to assess the noise levels at nearby receiver locations in the Project study area. Therefore, the exterior noise level limits set by the County of Riverside are used in this noise study to determine potential Project operational noise level impacts. The Riverside County Code, Section 9.52.040 *General sound level standards* (included in Appendix 3.1) identifies exterior noise level standards, which for the purpose of this report, are used to evaluate potential Project-related operational noise levels at exterior use areas. The County of Riverside Municipal Code identifies exterior noise level limits of 55 dBA L_{eq} during the 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. for noise-sensitive uses. (13)

3.4 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Project, noise from construction activities is typically limited to the hours of operation established under a jurisdiction's Municipal Code. Section 95C.08 of the City of Indio Municipal Code, provided in Appendix 3.2, indicates that construction activity is limited to the following permitted hours: (14)

- Pacific Standard Time: 7:00 a.m. to 6:00 p.m. Mondays to Fridays; 8:00 a.m. to 6:00 p.m. on Saturdays; or
- Pacific Daylight Time: 6:00 a.m. to 6:00 p.m. Mondays to Fridays; 7:00 a.m. to 6:00 p.m. on Saturdays; and
- Between 9:00 a.m. to 5:00 p.m. on Sundays and holidays all year-round.

However, neither the City of Indio General Plan or Municipal Codes 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*. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use. (8 p. 179).

3.5 CONSTRUCTION VIBRATION STANDARDS

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. (8)

To analyze vibration impacts originating from the operation and construction of the Project vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code, if such standards exist. However, the City of Indio does not identify specific vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, (9 p. 38) Table 19, vibration damage are used in this noise study to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive buildings adjacent to the Project site can best be described as "older residential structures" with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (10) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

B. Generation of excessive ground-borne vibration or ground-borne noise levels?

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

4.1 NOISE LEVEL INCREASES (THRESHOLD A)

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing baseline 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.* (15) 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) (16) developed guidance to be used for the assessment of permanent 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 long-term (annual) exposure to aircraft noise, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (15) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the without project noise levels are below 60 dBA. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be

appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. The FICON guidance provides an established source of criteria to assess the impacts of substantial permanent increase in baseline ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project (baseline) noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses.

These levels of increases and their perceived acceptance are consistent with guidance provided by both the Federal Highway Administration (5 p. 9) and Caltrans (17 p. 2_48).

4.2 NON-NOISE-SENSITIVE NOISE LEVEL INCREASES

The City of Indio General Plan Noise Element, Table 11-1, *Noise Compatibility Guidelines* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise level for non-noise-sensitive land uses is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* per the *Noise Compatibility Guidelines*. (12)

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 rely on the City of Indio General Plan Noise Element, Table 11-1, *Noise Compatibility Guidelines normally acceptable* 70 dBA CNEL exterior noise level criteria.

4.3 VIBRATION (THRESHOLD B)

As described in Section 3.5, the vibration impacts originating from the construction of Ave 43 / Calhoun St, vibration-generating activities are appropriately evaluated using the Caltrans vibration damage thresholds to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive buildings adjacent to the Project site can best be described as “older residential structures” with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

4.4 CEQA GUIDELINES NOT FURTHER ANALYZED

CEQA Noise Threshold C applies when there are nearby public and private airports and/or air strips and focuses on land use compatibility of the Project to nearby airports and airstrips. The Project site is not located within two miles of a public airport or within an airport land use plan.

The closest airport is the Bermuda Dunes Airport located roughly 2.7 miles northwest of the Project site. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to CEQA Appendix G Guideline C.

4.5 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-1 shows the significance criteria summary matrix.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive[1]	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[1,2]	if ambient is < 70 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
On-Site[3]	Noise Sensitive	Exterior Noise Level Standard	65 dBA CNEL	
		Interior Noise Level Standard	45 dBA CNEL	
Operational	Noise-Sensitive	if ambient is < 60 dBA CNEL[1]	≥ 5 dBA CNEL Project increase	
		if ambient is 60 - 65 dBA CNEL[1]	≥ 3 dBA CNEL Project increase	
		if ambient is > 65 dBA CNEL[1]	≥ 1.5 dBA CNEL Project increase	
		Residential[4]	55 dBA L_{eq}	45 dBA L_{eq}
		Commercial/Industrial[4]	85 dBA L_{eq}	55 dBA L_{eq}
Construction	Noise-Sensitive	Noise Level Threshold[5]	80 dBA L_{eq}	n/a
		Vibration Level Threshold[6]	0.30 PPV (in/sec)	

[1] FICON, 1992.
[2] City of Indio General Plan Noise Element, Table 11-1.
[3] County of Riverside General Plan Noise Element.
[4] County of Riverside Municipal Code, Section 9.52.040 (Appendix 3.1).
[5] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[6] Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19.
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at eight locations in the Project study area. The measurement 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 Friday, June 10, 2022. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the 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. (18)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (3) 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*. (8)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (8) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels

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

5.3 NOISE MEASUREMENT RESULTS

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

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

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]	
		Daytime	Nighttime
L1	Near La Fitness located at 42900 Jackson Street	67.1	65.3
L2	Near existing residence located at 483279 White Stallion Road.	64.9	59.4
L3	Existing park land use located at 83700 Avenue 43.	62.1	59.1
L4	Existing residence located at 43309 Avenida Estrella.	50.7	52.7
L5	Existing residence located at 43347 Commanche Street.	52.2	55.6
L6	Existing residence located at 83509 Hopi Avenue.	64.0	62.9
L7	Located near an existing residence at 43561 Pueblo Street	68.8	70.5
L8	Located near an existing residence located at 42969 Hopi Avenue	70.4	69.7

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

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 of the daytime and nighttime hours.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

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6 TRAFFIC NOISE METHODS AND PROCEDURES

The following section outlines the methods and procedures used to estimate and analyze the future traffic noise environment. Consistent with the City of Indio and OPR land use/noise compatibility standards, all transportation related noise levels are presented in terms of the 24-hour CNEL's.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (19) 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. (20) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (21)

6.1.1 ON-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the on-site roadway parameters including the ADT volumes used for this study. The on-site roadway parameters are based on the City of Indio General Plan Circulation Element roadway classifications and consistent with the County of Riverside office of Industrial Hygiene *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures*. (22) The maximum two-way traffic volumes at a level of service C, shown on Table 6-1, were obtained from Figure C-3 of the County of Riverside General Plan Circulation Element (23) and reflect future long-range traffic conditions needed to assess the on-site traffic noise environment and to identify the appropriate noise mitigation measures that address the worst-case future noise conditions. Soft site conditions account for the sound propagation loss over a reflective surface between the source and the receiver.

Table 6-2 provides the time of day (daytime, evening, and nighttime) vehicle splits and Table 6-3 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 6-1: ON-SITE ROADWAY PARAMETERS

Roadway Segment	Classification[1]	Lanes	Average Daily Traffic Volume[2,3]	Speed Limit (mph)	Site Conditions
I-10	Freeway	6	76,000	70	Soft
Calhoun Street	Collector	2	3,100	35	Soft
Avenue 43	Collector	2	7,400	45	Soft

[1] Road classifications based upon the City of Indio General Plan.
[2] Ave 42/Calhoun St Focused Traffic Analysis, Urban Crossroads, Inc., 2020 Traffic Volumes, Caltrans.

TABLE 6-2: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
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%

[1] Typical Southern California vehicle mix.
"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 6-3: TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

Roadway	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
I-10[1]	78.10%	6.10%	15.80%	100.00%
Ave 43 / Calhoun St[2]	97.42%	1.84%	0.74%	100.00%

[1] Caltrans Truck Traffic Counts 2020
[2] Typical Southern California vehicle mix.

6.1.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-4 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the five off-site study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Indio and County of Riverside General Pla

n Circulation Element, and the posted vehicle speeds. Consistent with the Ave 43 / Calhoun St Focused Traffic Analysis prepared by Urban Crossroads, Inc. (2) the off-site traffic noise analysis includes the following traffic scenarios.

- Existing (2021)
- Existing plus Project (E+P)
- General Plan Buildout (2040) Without Project
- General Plan Buildout (2040) With Project

The average daily traffic (ADT) volumes used for this study are presented on Table 6-5.

TABLE 6-4: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Land Use[1]	Classification[2]	Centerline Distance to Receiving Land Use (Feet)[3]	Vehicle Speed (mph)
1	Avenue 42	w/o Calhoun Street	Sensitive	4-Lane Boulevard	55'	45
2	Avenue 42	e/o Calhoun Street	Sensitive	4-Lane Boulevard	55'	45
3	Avenue 43	w/o Calhoun Street	Sensitive	Collector	37'	30
4	Avenue 43	e/o Calhoun Street	Sensitive	Collector	37'	30
5	Calhoun Street	s/o Avenue 42	Sensitive	Collector	37'	30

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] Calhoun/Ave 42 Focused Traffic Analysis, Urban Crossroads, Inc.
[3] Based upon the right-of-way distances for each roadway classification.

TABLE 6-5: OFF-SITE AVERAGE DAILTY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]			
			Existing		Future Conditions	
			Without Project	With Project	Without Project	With Project
1	Avenue 42	w/o Calhoun Street	8,500	11,800	18,800	22,000
2	Avenue 42	e/o Calhoun Street	6,300	6,700	16,300	16,700
3	Avenue 43	w/o Calhoun Street	4,100	6,900	4,500	7,300
4	Avenue 43	e/o Calhoun Street	4,700	6,700	7,200	7,400
5	Calhoun Street	s/o Avenue 42	1,700	5,300	2,100	5,700

[1] Calhoun/Ave 42 Focused Traffic Analysis, Urban Crossroads, Inc.

[1] Calhoun/Ave 42 Focused Traffic Analysis, Urban Crossroads, Inc.

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7 ON-SITE TRAFFIC NOISE ANALYSIS

An on-site exterior noise impact analysis has been completed to determine the noise exposure levels that would result from adjacent transportation noise sources in the Project study area, and to identify potential noise mitigation measures that would achieve acceptable Project exterior and interior noise levels. The primary source of transportation noise affecting the Project site is anticipated to be from I-10, Avenue 43 and Calhoun Street. The Project would also be exposed to nominal traffic noise from the Project's internal roads. However, due to the distance and low traffic volume/speed, traffic noise from these roads will not make a substantive contribution to ambient noise conditions.

7.1 EXTERIOR NOISE ANALYSIS

Using the FHWA traffic noise prediction model and the parameters outlined in Tables 6-1 to 6-3, the expected future exterior noise levels for the on-site Project land uses were estimated. Table 7-1 presents a summary of future on-site exterior traffic noise levels. The on-site traffic noise analysis calculations are provided in Appendix 7.1.

TABLE 7-1: UNMITIGATED EXTERIOR NOISE LEVELS

Locations	Roadway	Unmitigated Exterior Noise Level (dBA CNEL)[2]	Land Use Compatibility[3]
Phase 1 s/o Ave 43	Avenue 43	67.4	*Conditionally Acceptable*
Phase 1 e/o Calhoun St	Calhoun Street	61.0	*Acceptable*
Phase 2 Edge of Project Site to I-10	I-10	84.2	*Unacceptable*
Phase 2 35' Setback from I-10	I-10	80.0	*Unacceptable*
Phase 2 130' Setback from I-10	I-10	75.0	*Conditionally Acceptable*
Phase 2 200' Setback from I-10	I-10	72.9	*Conditionally Acceptable*
Phase 2 325' Setback from I-10	I-10	70.0	*Conditionally Acceptable*
Phase 2 800' Setback from I-10	I-10	65.0	*Acceptable*
Phase 2 s/o Ave 43	Avenue 43	67.4	*Conditionally Acceptable*
Phase 2 w/o Calhoun St n/o Hopi St	Calhoun Street	61.0	*Acceptable*
Phase 2 w/o Calhoun St s/o Hopi St	Calhoun Street	68.3	*Conditionally Acceptable*
Phase 1 Main Swimming Pool	Avenue 43	52.6	*Acceptable*
Phase 1 west Swimming Pool	Calhoun Street	48.3	*Acceptable*

[1] Exterior on-site traffic noise level calculations are included in Appendix 8.1.
[2] Based on the General Plan land use compatibility guidelines as shown on Exhibit 3-A.

Exterior noise mitigation is generally limited to the noise sensitive private outdoor use areas, e.g., backyards for single-family residential land uses and common/recreation areas for multiple family residential land uses. As shown on Table 7-1, the exterior uses areas (e.g., swimming pools) for the Phase 1 multi-family residential land uses will experience noise levels ranging from 48.3 to 52.6 dBA CNEL, which is considered *acceptable*. Therefore, no exterior noise mitigation is

required to satisfy the City of Indio *Land Use Compatibility for Community Noise Exposure* guidelines for multi-family residential exterior use areas.

Noise levels at the façades of the residential units along Calhoun Street in Phase 1 would be exposed to noise levels up to 61.0 dBA CNEL, which is considered *acceptable,* and no further analysis is required. However, noise levels at the façade of the residential units along Avenue 43 would be exposed to noise levels up to 67.4 dBA CNEL, which is considered *conditionally acceptable*. For *conditionally acceptable* exterior noise levels, the *Land Use Compatibility for Community Noise Exposure* guidelines state that *new construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use.* Policy NE-1.2 states that the any mitigation measures for compatibility issues *"should focus on architectural features and building design and construction, rather than site design features, such as excessive setbacks, berms, and sound walls, to maintain compatibility with adjacent and surrounding uses*." An interior analysis is provided in Section 7.2.

The location of proposed buildings and amenities included in Phase 2 are unknown at this time. However, it can be assumed the residential units in Phase 2 would be similar distances to Avenue 43 and Calhoun Street as in Phase 1, thus it is anticipated that residential units fronting Calhoun Street, north of Hopi Avenue would be exposed to noise levels up to 61.0 dBA CNEL, which is considered *acceptable*. Residential units in Phase 2 fronting Avenue 43 would be exposed to noise levels of up to 67.4 dBA CNEL and residential units fronting Calhoun Street, south of Hopi Avenue would be exposed to noise levels up to 68.3 dBA CNEL, which is considered *conditionally acceptable* for both locations. The noise levels along Calhoun Steet south of Hopi Avenue are primarily affected by I-10 traffic noise.

Based on the traffic noise associated with I-10, multifamily residential units within 130 feet of the I-10 right-of-way will experience *unacceptable* noise levels without additional mitigation, beyond 130 and within 800 feet of the I-10 right-of-way noise levels would be *conditionally acceptable*. At distances greater than 800 feet from the I-10 right-of-way noise traffic levels would be less than 65 dBA CNEL and would be considered *acceptable*.

As stated in Policy NE-1.2, measures should *"focus on architectural features and building design and construction"* not on "*site design features, such as excessive setbacks, berms, and sound walls."* The intent of focusing on architectural features and building design is to "*maintain compatibility with adjacent and surrounding uses*". Based on existing development along I-10 south of the Project site the nearest building is approximately 50 feet from the I-10 right-of-way however, no specific setbacks or barriers exist, thus this analysis is based on using no setback from the I-10 right-of-way and evaluates structural/architectural upgrades that can be used to achieve the City of Indio interior noise standards.

To demonstrate that the Project satisfies the City of Indio compatibility guidelines, an interior noise analysis is provided in this noise study to identify architectural/structural components to satisfy the General Plan Noise Element interior noise level standards. Section 7.2 presents the interior noise analysis results for the multi-family residential land uses.

7.2 INTERIOR NOISE ANALYSIS

To ensure that the interior noise levels comply with the interior noise level standards, future exterior noise levels were calculated at the estimated at the first, second, and third floor building façade locations for planned multi-family residences.

7.2.1 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." (8) (24) 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.

7.2.2 INTERIOR NOISE LEVEL ASSESSMENT

To provide the necessary interior noise level reduction of 25 dBA, a windows-closed condition and a means of mechanical ventilation (e.g., air conditioning) will be necessary for future on-site residences. This interior analysis focuses on exterior locations where façade noise levels would be considered *conditionally acceptable*. Thus, exterior use areas and areas where noise levels are considered *acceptable* are not included in the interior analysis. Additionally, the analysis focuses on the minimum distance for *conditionally acceptable* noise levels along I-10 in Phase 2. Tables 7-2 to 7-4 show that the future unmitigated noise levels at the first, second, and third floor building façades are expected to range from 67.4 to 75.1 dBA CNEL. The interior noise assessment shows that multi-family residential uses can satisfy the interior noise standard using standard windows with a minimum STC rating of 27 in all of Phase 1 units fronting Avenue 43 and Calhoun Street. Therefore, noise compatibility impacts for Phase 1 are *less than significant*.

Within Phase 2, all locations except within 325 feet of I-10 could satisfy the interior noise standard using standard windows with a minimum STC rating of 27. Adjacent to I-10, STC ratings of up to 40 could be necessary for any windows or doors facing I-10. Based on the calculations presented in Table 7-2 to 7-4, interior noise levels could be reduced to 45 dBA CNEL or less. However, since the locations of buildings within Phase 2 has not been developed, a final noise study will be required prior to issuance of building permits as summarized in the Executive Summary.

7.2.3 INTERIOR TRAFFIC NOISE LEVEL COMPLIANCE

Tables 7-2 to 7-4 shows that unmitigated on-site interior traffic noise levels can comply with the City of Indio 45 dBA CNEL interior noise level standard for residential development with upgraded windows and doors. However, as final design plans are not available specific recommendations cannot be made for Phase 2, the following measure should be incorporated into the Project to demonstrate the Project would comply with the City of Indio interior noise level standards:

TABLE 7-2: FIRST FLOOR INTERIOR NOISE LEVELS (CNEL)

Location	Noise Level at Façade[2]	Required Interior Noise Reduction[3]	Estimated Interior Noise Reduction[4]	Upgraded Windows[5]	Interior Noise Level[6]	Threshold[7]	Threshold Exceeded?
Phase 1 s/o Ave 43	67.4	22.4	25.0	No	42.4	45	No
Phase 1 e/o Calhoun St	61.0	16.0	25.0	No	36.0	45	No
Phase 2 Edge of Project Site to I-10	84.2	39.2	25.0	Yes	59.2	45	Yes
Phase 2 35' Setback from I-10	80.0	35.0	25.0	Yes	55.0	45	Yes
Phase 2 130' Setback from I-10	75.0	30.0	25.0	Yes	50.0	45	Yes
Phase 2 325' Setback from I-10	70.0	25.0	25.0	No	45.0	45	No
Phase 2 800' Setback from I-10	65.0	20.0	25.0	No	40.0	45	No
Phase 2 s/o Ave 43	67.4	22.4	25.0	No	42.4	45	No
Phase 2 w/o Calhoun St n/o Hopi St	61.0	16.0	25.0	No	36.0	45	No
Phase 2 w/o Calhoun St s/o Hopi St	68.3	23.3	25.0	No	43.3	45	No

[1] Project site plan is shown on Exhibit 1-B.
[2] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning). See Appendix 8.1.
[3] Noise reduction to satisfy the interior noise level threshold.
[4] A minimum of 25 dBA noise reduction is assumed with standard building construction and approximately 2 dBA less than the STC rating for upgraded windows.
[5] Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?
[6] Estimated interior noise level with minimum STC rating for all windows.
[7] Interior noise level threshold: 45 dBA CNEL for residential use (California Code of Regulations, Title 24, Building Standards Administrative Code).

TABLE 7-3: SECOND FLOOR INTERIOR NOISE LEVELS (CNEL)

Building	Noise Level at Façade[2]	Required Interior Noise Reduction[3]	Estimated Interior Noise Reduction[4]	Upgraded Windows[5]	Interior Noise Level[6]	Threshold[7]	Threshold Exceeded?
Phase 1 s/o Ave 43	67.4	22.4	25.0	No	42.4	45	No
Phase 1 e/o Calhoun St	61.0	16.0	25.0	No	36.0	45	No
Phase 2 Edge of Project Site to I-10	84.2	39.2	25.0	Yes	59.2	45	Yes
Phase 2 35' Setback from I-10	80.0	35.0	25.0	Yes	55.0	45	Yes
Phase 2 130' Setback from I-10	75.0	30.0	25.0	Yes	50.0	45	Yes
Phase 2 325' Setback from I-10	70.0	25.0	25.0	No	45.0	45	No
Phase 2 800' Setback from I-10	65.0	20.0	25.0	No	40.0	45	No
Phase 2 s/o Ave 43	67.4	22.4	25.0	No	42.4	45	No
Phase 2 w/o Calhoun St n/o Hopi St	61.0	16.0	25.0	No	36.0	45	No
Phase 2 w/o Calhoun St s/o Hopi St	68.3	23.3	25.0	No	43.3	45	No

[1] Project site plan is shown on Exhibit 1-B.
[2] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning). See Appendix 8.1.
[3] Noise reduction to satisfy the interior noise level threshold.
[4] A minimum of 25 dBA noise reduction is assumed with standard building construction and approximately 2 dBA less than the STC rating for upgraded windows.
[5] Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?
[6] Estimated interior noise level with minimum STC rating for all windows.
[7] Interior noise level threshold: 45 dBA CNEL for residential use (California Code of Regulations, Title 24, Building Standards Administrative Code).

TABLE 7-4: THIRD FLOOR INTERIOR NOISE LEVELS (CNEL)

Building	Noise Level at Façade[2]	Required Interior Noise Reduction[3]	Estimated Interior Noise Reduction[4]	Upgraded Windows[5]	Interior Noise Level[6]	Threshold[7]	Threshold Exceeded?
Phase 1 s/o Ave 43	67.1	22.1	25.0	No	42.1	45	No
Phase 1 e/o Calhoun St	60.6	15.6	25.0	No	35.6	45	No
Phase 2 Edge of Project Site to I-10	84.1	39.1	25.0	Yes	59.1	45	Yes
Phase 2 35' Setback from I-10	79.9	34.9	25.0	Yes	54.9	45	Yes
Phase 2 130' Setback from I-10	75.0	30.0	25.0	Yes	50.0	45	Yes
Phase 2 325' Setback from I-10	70.0	25.0	25.0	No	45.0	45	No
Phase 2 800' Setback from I-10	65.0	20.0	25.0	No	40.0	45	No
Phase 2 s/o Ave 43	67.1	22.1	25.0	No	42.1	45	No
Phase 2 w/o Calhoun St n/o Hopi St	60.6	15.6	25.0	No	35.6	45	No
Phase 2 w/o Calhoun St s/o Hopi St	68.3	23.3	25.0	No	43.3	45	No

[1] Project site plan is shown on Exhibit 1-B.
[2] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning). See Appendix 8.1.
[3] Noise reduction to satisfy the interior noise level threshold.
[4] A minimum of 25 dBA noise reduction is assumed with standard building construction and approximately 2 dBA less than the STC rating for upgraded windows.
[5] Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?
[6] Estimated interior noise level with minimum STC rating for all windows.
[7] Interior noise level threshold: 45 dBA CNEL for residential use (California Code of Regulations, Title 24, Building Standards Administrative Code).

8 OFF-SITE TRAFFIC NOISE ANALYSIS

To assess the off-site transportation noise level impacts associated with development of the proposed Project, noise level contours were developed based on the Ave 43 / Calhoun St Focused Traffic Analysis prepared by Urban Crossroads, Inc. (2) Noise level contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway.

8.1 TRAFFIC NOISE CONTOURS

Noise level contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise level 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 level 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 8-1 to 8-4 present a summary of the exterior traffic noise levels for each traffic condition. Appendix 8.1 includes the traffic noise level contours worksheets for each traffic condition.

TABLE 8-1: EXISTING WITHOUT PROJECT NOISE LEVEL CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Avenue 42	w/o Calhoun Street	Sensitive	72.2	77	167	359
2	Avenue 42	e/o Calhoun Street	Sensitive	70.9	63	136	294
3	Avenue 43	w/o Calhoun Street	Sensitive	62.7	RW	RW	56
4	Avenue 43	e/o Calhoun Street	Sensitive	63.3	RW	RW	61
5	Calhoun Street	s/o Avenue 42	Sensitive	58.9	RW	RW	RW

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 8-2: EXISTING WITH PROJECT NOISE LEVEL CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Avenue 42	w/o Calhoun Street	Sensitive	73.6	96	207	447
2	Avenue 42	e/o Calhoun Street	Sensitive	71.2	66	142	306
3	Avenue 43	w/o Calhoun Street	Sensitive	65.0	RW	37	79
4	Avenue 43	e/o Calhoun Street	Sensitive	64.8	RW	RW	78
5	Calhoun Street	s/o Avenue 42	Sensitive	63.8	RW	RW	66

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 8-3: GENERAL PLAN BUILDOUT WITHOUT PROJECT NOISE LEVEL CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Avenue 42	w/o Calhoun Street	Sensitive	75.7	131	283	609
2	Avenue 42	e/o Calhoun Street	Sensitive	75.0	119	257	554
3	Avenue 43	w/o Calhoun Street	Sensitive	63.1	RW	RW	60
4	Avenue 43	e/o Calhoun Street	Sensitive	65.1	RW	38	81
5	Calhoun Street	s/o Avenue 42	Sensitive	59.8	RW	RW	RW

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 8-4: GENERAL PLAN BUILDOUT WITH PROJECT NOISE LEVEL CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Avenue 42	w/o Calhoun Street	Sensitive	76.3	146	314	676
2	Avenue 42	e/o Calhoun Street	Sensitive	75.2	121	261	563
3	Avenue 43	w/o Calhoun Street	Sensitive	65.2	RW	38	82
4	Avenue 43	e/o Calhoun Street	Sensitive	65.3	RW	39	83
5	Calhoun Street	s/o Avenue 42	Sensitive	64.1	RW	RW	70

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

8.2 EXISTING PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report for informational purposes and to fully analyze all the existing traffic scenarios identified in the Traffic Analysis prepared by Urban Crossroads, Inc. However, the analysis of existing off-site traffic noise levels plus traffic noise generated by the proposed Project scenario will not actually occur since the Project would not be fully constructed and operational until Year 2023 conditions. Table 8-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels range from 58.9 to 72.2 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 8-2 shows the Existing with Project conditions ranging from 63.8 to 73.6 dBA CNEL. Table 8-5 shows that the Project off-site traffic noise level increases range from 0.3 to 4.9 dBA CNEL on the study area roadway segments. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

8.3 GENERAL PLAN BUILDOUT TRAFFIC NOISE LEVEL INCREASES

Table 8-3 presents the General Plan Buildout without Project conditions CNEL noise levels. The General Plan Buildout without Project exterior noise levels range from 59.8 to 75.7 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 8-4 shows that the General Plan Buildout with Project conditions range from 64.1 to 76.3 dBA CNEL. Table 8-6 shows that the Project off-site traffic noise level increases range from 0.2 to 4.3 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

TABLE 8-5: EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Avenue 42	w/o Calhoun Street	Sensitive	72.2	73.6	1.4	1.5	No
2	Avenue 42	e/o Calhoun Street	Sensitive	70.9	71.2	0.3	1.5	No
3	Avenue 43	w/o Calhoun Street	Sensitive	62.7	65.0	2.3	3.0	No
4	Avenue 43	e/o Calhoun Street	Sensitive	63.3	64.8	1.5	3.0	No
5	Calhoun Street	s/o Avenue 42	Sensitive	58.9	63.8	4.9	5.0	No

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

TABLE 8-6: GENERAL PLAN BUILDOUT WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Avenue 42	w/o Calhoun Street	Sensitive	75.7	76.3	0.6	1.5	No
2	Avenue 42	e/o Calhoun Street	Sensitive	75.0	75.2	0.2	1.5	No
3	Avenue 43	w/o Calhoun Street	Sensitive	63.1	65.2	2.1	3.0	No
4	Avenue 43	e/o Calhoun Street	Sensitive	65.1	65.3	0.2	1.5	No
5	Calhoun Street	s/o Avenue 42	Sensitive	59.8	64.1	4.3	5.0	No

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

9 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following sensitive receiver locations, as shown on Exhibit 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, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

To describe the potential off-site Project noise levels, eight receiver locations in the vicinity of the Project site were identified. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the project boundary to each receiver location.

R1: Location R1 represents an existing residence at 83279 White Stallion Road, approximately 199 feet north of the Project site. R1 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents an existing residence at 42968 Southfork Court, approximately 115 feet north of the Project site. R2 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents an existing noise sensitive park land use at 83700 Avenue 43, approximately 114 feet north of the Project site. R3 is placed in the outdoor use areas nearest the Project site. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents an existing residence at 43309 Avenida Estrella, approximately 12 feet east of the Project site. R4 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

R5: Location R5 represents the existing noise sensitive residence at 43347 Commanche Street, approximately 16 feet south of the Project site. R5 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

R6: Location R6 represents an existing residence 83509 Hopi Avenue, approximately 16 feet east of the Project site. R6 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L6, to describe the existing ambient noise environment.

R7: Location R7 represents an existing residence at 43561 Pueblo Street, approximately 25 feet east of the Project site. R7 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L7, to describe the existing ambient noise environment.

R8: Location R8 represents an existing residence located at 42969 Hopi Avenue, approximately 69 feet north of the Project site. R8 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L8, to describe the existing ambient noise environment.

EXHIBIT 9-A: RECEIVER LOCATIONS

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10 OPERATIONAL NOISE ANALYSIS

This section analyzes the potential stationary-source (i.e., on-site) operational noise impacts at the nearest receiver locations, identified in Section 9, resulting from the operation of the Project. Exhibit 10-A identifies the noise source locations used to assess the operational noise levels associated with Phase 1. As building locations for Phase 2 have not yet been identified, a detailed noise study would be required prior to approval of building plans for Phase 2. Therefore, the following measure will be included in Project design plans for Phase 2.

Noise 2 Prior to the issuance of a building permit, the applicant, or its designee, will prepare an acoustical study(s) of proposed commercial land use site plans, which will identify all noise-generating areas and associated equipment, predict noise levels at property lines from all identified areas, and recommended mitigation to be implemented (e.g., enclosures, barriers, site orientation, reduction of parking stalls), as necessary, to comply with the Riverside County Code, Section 9.52.040.

10.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the expected typical daytime and nighttime activities at the Project site associated with Phase 1. The on-site Project-related noise sources are expected to include: air conditioning units, outdoor activity areas, and pool activity.

10.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise levels were taken from manufacturers specification or collected from similar types of activities to represent the noise levels expected with the development of the Project. This section provides a description of the reference noise levels shown in Table 10-1 used to estimate the Project operational noise impacts.

The reference noise level measurements for outdoor activities and swimming pool activities in this section were collected by Urban Crossroads, Inc. using a Larson Davis LxT Type 1 precision sound level meter (serial number 01146). The LxT sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 200, was programmed in "slow" mode to record noise levels in "A" weighted form and was located at approximately five feet above the ground elevation. The sound level meter and microphone was 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. (18)

EXHIBIT 10-A: OPERATIONAL NOISE SOURCE LOCATIONS

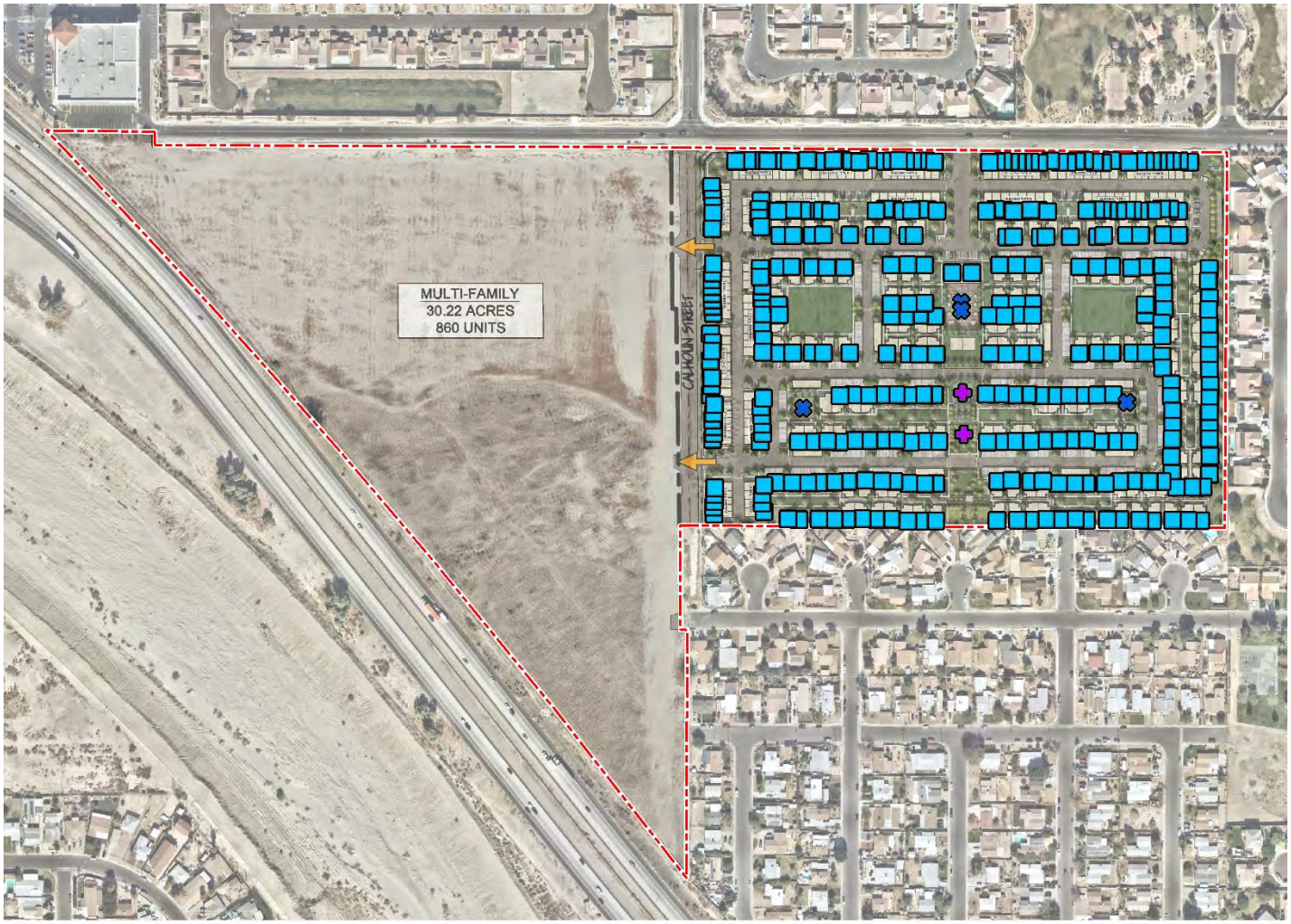

TABLE 10-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source[1]	Noise Source Height (Feet)	Min./Hour[2]		Reference Noise Level @50 feet (dBA L_{eq})	Sound Power Level (dBA)[3]
		Day	Night		
Air Conditioning Units	3'	45	30	44.4	76.0
Outdoor Activity	5'	60	0	59.9	91.5
Pool Activity	5'	60	0	63.0	94.6

10.2.2 AIR CONDITIONING UNITS

To assess the noise levels created by the ground-mounted air conditioning units, reference noise levels from a Lennox model XC13N used as representative of the air conditioning units that would be similar to those used on the Project. For the purposes of modeling, it is estimated each residence would require between 3 to 5 tons of air conditioning. According to the product data sheet a Lennox model XC13N with a capacity ranging from 3 to 5 tons produces a maximum sound power level of 76 dBA L_w, see Appendix 10.1. For purposes of this analysis, it was assumed the air conditioners would operate 45 minutes out of an hour during the daytime (7:00 a.m. to 10:00 p.m.) and 30 minutes out of an hour at nighttime (10:00 p.m. to 7:00 a.m.). The acoustic center of each unit will be located three feet above ground elevation.

10.2.3 OUTDOOR ACTIVITY AREA

To describe the outdoor common area courtyards activity areas, a reference noise level measurement was taken. At 50 feet, the reference noise level is 59.9 dBA L_{eq} at a noise source height of 5 feet or a sound power level of 91.5 dBA L_w. The reference noise level measurement includes outdoor eating, drinking, with patrons laughing and talking. Outdoor activities are limited to the daytime hours.

10.2.4 POOL ACTIVITY

To represent the noise levels associated with pool activities, Urban Crossroads collected a reference noise level measurement. The measured reference noise level at the uniform 50-foot reference distance is 54.7 dBA L_{eq} for pool activity or a sound power level of 94.6 dBA L_w. The pool activity noise levels include kids playing, running, screaming, splashing, playing with a ball, and parents talking. Noise associated with pool activities is expected to occur for the entire hour (60 minutes). Swimming pool activities are limited to the daytime hours.

10.3 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.

Using the ISO 9613-2 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation

inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613-2 protocol, the CadnaA noise prediction model relies on the reference sound power level (L_w) to describe individual noise sources. While sound pressure levels (e.g., L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground attenuation factor of 0.5 was used in the CadnaA noise analysis to account for mixed ground representing a combination of hard and soft surfaces. Appendix 10.1 includes the detailed noise model inputs used to estimate the Project operational noise levels presented in this section.

10.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include air conditioning units, outdoor activity areas, and pool activity, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. Table 10-2 shows the Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 34.3 to 49.1 dBA L_{eq}.

TABLE 10-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Noise Levels by Receiver Location (dBA Leq)							
	R1	R2	R3	R4	R5	R6	R7	R8
Air Conditioning Units	32.4	38.4	41.6	43.9	43.7	38.7	36.7	31.8
Outdoor Activity	25.7	31.3	33.8	35.5	38.4	33.0	31.4	25.2
Pool Activity	30.1	38.4	43.0	46.5	47.1	36.3	34.0	29.4
Total (All Noise Sources)	**35.0**	**41.8**	**45.7**	**48.6**	**49.1**	**41.4**	**39.3**	**34.3**

[1] See Exhibit 10-A for the noise source locations. CadnaA noise model calculations are included in Appendix 10.1.

Table 10-3 shows the Project operational noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. The nighttime hourly noise levels at the off-site receiver locations are expected to range from 26.7 to 44.3 dBA L_{eq}. The differences between the daytime and nighttime noise levels are largely related to the estimated duration of noise activity as outlined in Table 10-1 and Appendix 10.1.

TABLE 10-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Noise Levels by Receiver Location (dBA Leq)							
	R1	R2	R3	R4	R5	R6	R7	R8
Air Conditioning Units	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Outdoor Activity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pool Activity	27.3	35.7	40.3	43.8	44.3	33.6	31.3	26.7
Total (All Noise Sources)	**27.3**	**35.7**	**40.3**	**43.8**	**44.3**	**33.6**	**31.3**	**26.7**

[1] See Exhibit 10-A for the noise source locations. CadnaA noise model calculations are included in Appendix 10.1.

10.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the County of Riverside exterior noise level standards at nearby noise-sensitive receiver locations. Table 10-4 shows that the daytime and nighttime operational noise levels associated with Project will satisfy the County of Riverside exterior noise level standards all nearby receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise sensitive receiver locations.

TABLE 10-4: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Project Operational Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)[3]		Noise Level Standards Exceeded?[4]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1	35.0	27.3	55	45	No	No
R2	41.8	35.7	55	45	No	No
R3	45.7	40.3	55	45	No	No
R4	48.6	43.8	55	45	No	No
R5	49.1	44.3	55	45	No	No
R6	41.4	33.6	55	45	No	No
R7	39.3	31.3	55	45	No	No
R8	34.3	26.7	55	45	No	No

[1] See Exhibit 9-A for the receiver locations.
[2] Proposed Project operational noise levels as shown on Tables 9-1 and 9-2.
[3] Exterior noise level standards for residential land use as shown on Table 4-1.
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 8:00 a.m.

10.6 PROJECT OPERATIONAL NOISE LEVEL INCREASES

To describe the Project operational noise level increases, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearest receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels

cannot be combined using standard arithmetic equations. (3) Instead, they must be logarithmically added using the following base equation:

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

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describes the Project noise level increases to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the daytime and nighttime ambient conditions are presented on Tables 10-5 and 10-6, respectively.

As indicated on Table 10-5, Phase 1 of the Project will generate daytime operational noise level increases ranging from 0.0 to 2.1 dBA L_{eq} at the nearest receiver locations. Table 10-6 shows that the Phase 1 of the Project will generate a nighttime operational noise level increases ranging from 0.0 to 0.5 dBA L_{eq} at the nearest receiver locations. Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented in Table 4-1. Therefore, the increases associated with Phase 1 will be *less than significant.*

TABLE 10-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	35.0	L1	67.1	67.1	0.0	1.5	No
R2	41.8	L2	64.9	64.9	0.0	3.0	No
R3	45.7	L3	62.1	62.2	0.1	3.0	No
R4	48.6	L4	50.7	52.8	2.1	5.0	No
R5	49.1	L5	52.2	53.9	1.7	5.0	No
R6	41.4	L6	64.0	64.0	0.0	3.0	No
R7	39.3	L7	68.8	68.8	0.0	1.5	No
R8	34.3	L8	70.4	70.4	0.0	1.5	No

[1] See Exhibit 9-A for the receiver locations.
[2] Total Project daytime operational noise levels as shown on Table 10-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

TABLE 10-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	27.3	L1	65.3	65.3	0.0	1.5	No
R2	35.7	L2	59.4	59.4	0.0	5.0	No
R3	40.3	L3	59.1	59.2	0.1	5.0	No
R4	43.8	L4	52.7	53.2	0.5	5.0	No
R5	44.3	L5	55.6	55.9	0.3	5.0	No
R6	33.6	L6	62.9	62.9	0.0	3.0	No
R7	31.3	L7	70.5	70.5	0.0	1.5	No
R8	26.7	L8	69.7	69.7	0.0	1.5	No

[1] See Exhibit 9-A for the receiver locations.
[2] Total Project nighttime operational noise levels as shown on Table 10-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

11 CONSTRUCTION ANALYSIS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 11-A shows the construction noise source locations (measured from the Project's site boundary) in relation to the nearest sensitive receiver locations previously described in Section 9.

11.1 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 are expected to occur in the following stages:

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

11.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe peak construction noise activities, this construction noise analysis was prepared using reference noise level measurements published in the *Road Construction Noise Model* (RCNM) by the FHWA (25). The RCNM model provides a comprehensive source of reference construction noise levels. Table 11-1 provides a summary of the RCNM construction reference noise level measurements expressed in hourly average dBA L_{max} using the estimated RCNM usage factors (25) to describe the construction activities for each stage of Project construction.

EXHIBIT 11-A: TYPICAL CONSTRUCTION NOISE SOURCE LOCATIONS

TABLE 11-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Equipmnet[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Combined Reference Noise Level (dBA L_{eq})
Site Preparation	Dozer	82.0	82.0
	Backhoe	78.0	
	Front End Loader	79.0	
Grading	Scraper	84.0	85.0
	Grader	85.0	
	Compactor (ground)	83.0	
Building Construction	Gradall	83.0	83.0
	Generator	81.0	
	Crane	81.0	
Paving	Paver	77.0	80.0
	Dump Truck	76.0	
	Roller	80.0	
Architectural Coating	Man Lift	75.0	78.0
	Compressor (air)	78.0	
	Pickup Truck	75.0	

[1] FHWA Road Construction Noise Model, 2006.

11.3 TYPICAL CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearest sensitive receiver locations were completed. To assess a reasonable worst-case construction scenario and account for the dynamic nature of construction activities, the Project construction noise analysis models the equipment combination with the highest reference level as a constantly moving point source within the construction area (Project site boundary). Construction impacts are based on the highest noise level calculated at each receiver location.

Table 11-1 presents the combined noise levels for all equipment, assuming they operate at the same time. As shown on Table 11-2, the construction noise levels are expected to range from 40.8 to 67.9 dBA L_{eq}, and the highest construction levels are expected to range from 47.8 to 67.9 dBA L_{eq} at the nearest receiver locations during construction of Phase 1. As shown on Table 11-3, the construction noise levels are expected to range from 42.5 to 67.5 dBA L_{eq}, and the highest construction levels are expected to range from 49.5 to 67.5 dBA L_{eq} at the nearest receiver locations during construction of Phase 2. Appendix 11.1 includes the detailed CadnaA construction noise model inputs.

TABLE 11-2: PHASE 1 CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	45.9	48.9	46.9	43.9	41.9	48.9
R2	55.5	58.5	56.5	53.5	51.5	58.5
R3	57.6	60.6	58.6	55.6	53.6	60.6
R4	64.5	67.5	65.5	62.5	60.5	67.5
R5	64.9	67.9	65.9	62.9	60.9	67.9
R6	53.9	56.9	54.9	51.9	49.9	56.9
R7	51.1	54.1	52.1	49.1	47.1	54.1
R8	44.8	47.8	45.8	42.8	40.8	47.8

[1] Noise receiver locations are shown on Exhibit 9-A.
[2] Construction noise level calculations based on distance from the construction activity, which is measured from the Project site boundary to the nearest receiver locations. CadnaA construction noise model inputs are included in Appendix 11.1.

TABLE 11-3: PHASE 2 CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	58.1	61.1	59.1	56.1	54.1	61.1
R2	55.3	58.3	56.3	53.3	51.3	58.3
R3	47.4	50.4	48.4	45.4	43.4	50.4
R4	46.5	49.5	47.5	44.5	42.5	49.5
R5	48.6	51.6	49.6	46.6	44.6	51.6
R6	64.5	67.5	65.5	62.5	60.5	67.5
R7	61.4	64.4	62.4	59.4	57.4	64.4
R8	64.3	67.3	65.3	62.3	60.3	67.3

[1] Noise receiver locations are shown on Exhibit 9-A.
[2] Construction noise level calculations based on distance from the construction activity, which is measured from the Project site boundary to the nearest receiver locations. CadnaA construction noise model inputs are included in Appendix 11.1.

11.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

As defined in Section 4, to evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, a construction-related daytime noise level threshold of 80 dBA L_{eq} is used as a reasonable threshold to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities as shown on Table 11-3. As shown on Table 11-3, the noise impacts due to project

construction will take place during the hours specified in Section 95C.08 of the City of Indio Municipal Code and, therefore, the daytime construction noise is considered *less than significant* at all receiver locations.

TABLE 11-4: PHASE 1 CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	48.9	80	No
R2	58.5	80	No
R3	60.6	80	No
R4	67.5	80	No
R5	67.9	80	No
R6	56.9	80	No
R7	54.1	80	No
R8	47.8	80	No

[1] Noise receiver locations are shown on Exhibit 9-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to the nearest receiver locations as shown on Table 11-2.
[3] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

TABLE 11-5: PHASE 2 CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	48.9	80	No
R2	58.5	80	No
R3	60.6	80	No
R4	67.5	80	No
R5	67.9	80	No
R6	56.9	80	No
R7	54.1	80	No
R8	47.8	80	No

[1] Noise receiver locations are shown on Exhibit 9-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to the nearest receiver locations as shown on Table 11-2.
[3] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

11.5 CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Ground vibration levels associated with various types of construction equipment are summarized on Table 11-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential for human response (annoyance) and building damage using the following vibration assessment methods defined by the Caltrans. To calculate various vibration levels at distance Caltrans provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 11-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Table 11-5 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 12 to 199 feet from Project construction activities, construction vibration velocity levels are estimated to range from less than 0.01 to 0.27 in/sec PPV. Based on maximum acceptable continuous vibration threshold of 0.30 PPV (in/sec), the typical Project construction vibration levels will fall below the building damage thresholds at all the noise sensitive receiver locations. Therefore, the Project-related vibration impacts are considered *less than significant* during typical construction activities at the Project site. Moreover, the vibration levels reported at the sensitive receiver locations are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

TABLE 11-5: PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)[2]	Typical Construction Vibration Levels PPV (in/sec)[3]					Thresholds PPV (in/sec)[4]	Thresholds Exceeded?[5]
		Small bulldozer	Jackhammer	Loaded Trucks	Large bulldozer	Highest Vibration Level		
R1	199'	0.00	0.00	0.00	0.00	0.00	0.3	No
R2	115'	0.00	0.00	0.01	0.01	0.01	0.3	No
R3	114'	0.00	0.00	0.01	0.01	0.01	0.3	No
R4	12'	0.01	0.11	0.23	0.27	0.27	0.3	No
R5	16'	0.01	0.07	0.15	0.17	0.17	0.3	No
R6	16'	0.01	0.07	0.15	0.17	0.17	0.3	No
R7	25'	0.00	0.04	0.08	0.09	0.09	0.3	No
R8	69'	0.00	0.01	0.02	0.02	0.02	0.3	No

[1] Receiver locations are shown on Exhibit 9-A.
[2] Distance from receiver location to Project construction boundary (Project site boundary).
[3] Based on the Vibration Source Levels of Construction Equipment (Table 11-4).
[4] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, Table 19, p. 38.
[5] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

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12 REFERENCES

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4. **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.
5. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
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8. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual, FTA Report No. 0123.* September 2018.
9. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
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19. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
20. **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.

21. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
22. **County of Riverside, Office of Industrial Hygiene.** *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures.* April 2015.
23. **County of Riverside.** *General Plan Circulation Element.* 2013.
24. **California Department of Transportation.** *Traffic Noise Analysis Protocol.* May 2011.
25. **FHWA.** *Roadway Construction Noise Model.* January 2006.

13 CERTIFICATIONS

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Ave 43 / Calhoun St 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 (619) 788-1971.

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Professional Certifications

Approved Acoustical Consultant • County of San Diego
FHWA Traffic Noise Model of Training • November 2004
CadnaA Basic and Advanced Training Certificate • October 2008.

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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)

9.52.030 - Definitions.

As used in this chapter, the following terms shall have the following meanings:

"Audio equipment" means a television, stereo, radio, tape player, compact disc player, mp3 player, I-POD or other similar device.

"Decibel (dB)" means a unit for measuring the relative amplitude of a sound equal approximately to the smallest difference normally detectable by the human ear, the range of which includes approximately one hundred thirty (130) decibels on a scale beginning with zero decibels for the faintest detectable sound. Decibels are measured with a sound level meter using different methodologies as defined below:

1. "A-weighting (dBA)" means the standard A-weighted frequency response of a sound level meter, which de-emphasizes low and high frequencies of sound in a manner similar to the human ear for moderate sounds.
2. "Maximum sound level (L_{max})" means the maximum sound level measured on a sound level meter.

"Governmental agency" means the United States, the state of California, Riverside County, any city within Riverside County, any special district within Riverside County or any combination of these agencies.

"Land use permit" means a discretionary permit issued by Riverside County pursuant to Riverside County Ordinance No. 348.

"Motor vehicle" means a vehicle that is self-propelled.

"Motor vehicle sound system" means a stereo, radio, tape player, compact disc player, mp3 player, I-POD or other similar device.

"Noise" means any loud, discordant or disagreeable sound.

"Occupied property" means property upon which is located a residence, business or industrial or manufacturing use.

"Off-highway vehicle" means a motor vehicle designed to travel over any terrain.

"Public or private school" means an institution conducting academic instruction at the preschool, elementary school, junior high school, high school, or college level.

"Public property" means property owned by a governmental agency or held open to the public, including, but not limited to, parks, streets, sidewalks, and alleys.

"Sensitive receptor" means a land use that is identified as sensitive to noise in the noise element of the Riverside County general plan, including, but not limited to, residences, schools, hospitals, churches, rest homes, cemeteries or public libraries.

"Sound-amplifying equipment" means a loudspeaker, microphone, megaphone or other similar device.

"Sound level meter" means an instrument meeting the standards of the American National Standards Institute for Type 1 or Type 2 sound level meters or an instrument that provides equivalent data.

(Ord. 847 § 3, 2006)

9.52.040 - General sound level standards.

No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table 1.

TABLE 1

Sound Level Standards (Db L_{max})

GENERAL PLAN FOUNDATION COMPONENT	GENERAL PLAN LAND USE DESIGNATION	GENERAL PLAN LAND USE DESIGNATION NAME	DENSITY	MAXIMUM DECIBEL LEVEL	
				7 am—10 pm	10 pm—7 am
Community Development	EDR	Estate Density Residential	2 AC	55	45
	VLDR	Very Low Density Residential	1 AC	55	45
	LDR	Low Density Residential	1/2 AC	55	45
	MDR	Medium Density Residential	2—5	55	45
	MHDR	Medium High Density Residential	5—8	55	45
	HDR	High Density Residential	8—14	55	45
	VHDR	Very High Density Residential	14—20	55	45
	H'TDR	Highest Density Residential	20+	55	45
	CR	Retail Commercial		65	55
	CO	Office Commercial		65	55
	CT	Tourist Commercial		65	55
	CC	Community Center		65	55
	LI	Light Industrial		75	55

	HI	Heavy Industrial		75	75
	BP	Business Park		65	45
	PF	Public Facility		65	45
	SP	Specific Plan-Residential		55	45
		Specific Plan-Commercial		65	55
		Specific Plan-Light Industrial		75	55
		Specific Plan-Heavy Industrial		75	75
Rural Community	EDR	Estate Density Residential	2 AC	55	45
	VLDR	Very Low Density Residential	1 AC	55	45
	LDR	Low Density Residential	1/2 AC	55	45
Rural	RR	Rural Residential	5 AC	45	45
	RM	Rural Mountainous	10 AC	45	45
	RD	Rural Desert	10 AC	45	45
Agriculture	AG	Agriculture	10 AC	45	45
Open Space	C	Conservation		45	45
	CH	Conservation Habitat		45	45
	REC	Recreation		45	45
	RUR	Rural	20 AC	45	45
	W	Watershed		45	45
	MR	Mineral Resources		75	45

(Ord. 847 § 4, 2006)

9.52.050 - Sound level measurement methodology.

Sound level measurements may be made anywhere within the boundaries of an occupied property. The actual location of a sound level measurement shall be at the discretion of the enforcement officials identified in Section 9.52.080 of this chapter. Sound level measurements shall be made with a sound level meter. Immediately before a measurement is made, the sound level meter shall be calibrated utilizing an acoustical calibrator meeting the standards of the American National Standards Institute. Following a sound level measurement, the calibration of the sound level meter shall be re-verified. Sound level meters and calibration equipment shall be certified annually.

(Ord. 847 § 5, 2006)

9.52.060 - Special sound sources standards.

The general sound level standards set forth in Section 9.52.040 of this chapter apply to sound emanating from all sources, including the following special sound sources, and the person creating, or allowing the creation of, the sound is subject to the requirements of that section. The following special sound sources are also subject to the following additional standards, the failure to comply with which constitutes separate violations of this chapter:

A. Motor Vehicles.
    1. Off-Highway Vehicles.
        a. No person shall operate an off-highway vehicle unless it is equipped with a USDA-qualified spark arrester and a constantly operating and properly maintained muffler. A muffler is not considered constantly operating and properly maintained if it is equipped with a cutout, bypass or similar device.
        b. No person shall operate an off-highway vehicle unless the noise emitted by the vehicle is not more than ninety-six (96) dBA if the vehicle was manufactured on or after January 1, 1986 or is not more than one hundred one (101) dBA if the vehicle was manufactured before January 1, 1986. For purposes of this subsection, emitted noise shall be measured a distance of twenty (20) inches from the vehicle tailpipe using test procedures established by the Society of Automotive Engineers under Standard J-1287.
    2. Sound Systems. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, between the hours of ten p.m. and eight a.m., such that the sound system is audible to the human ear inside any inhabited dwelling. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, at any other time such that the sound system is audible to the human ear at a distance greater than one hundred (100) feet from the vehicle.

B. Power Tools and Equipment. No person shall operate any power tools or equipment between the hours of ten p.m. and eight a.m. such that the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling in which the power tools or equipment may be located. No person shall operate any power tools or equipment at any other time such that the power tools or equipment are audible to the human ear at a distance greater than one hundred (100) feet from the power tools or equipment.

C. Audio Equipment. No person shall operate any audio equipment, whether portable or not, between the hours of ten p.m. and eight a.m. such that the equipment is audible to the human ear inside an inhabited

dwelling other than a dwelling in which the equipment may be located. No person shall operate any audio equipment, whether portable or not, at any other time such that the equipment is audible to the human ear at a distance greater than one hundred (100) feet from the equipment.

D. Sound-Amplifying Equipment and Live Music. No person shall install, use or operate sound-amplifying equipment, or perform, or allow to be performed, live music unless such activities comply with the following requirements. To the extent that these requirements conflict with any conditions of approval attached to an underlying land use permit, these requirements shall control:

1. Sound-amplifying equipment or live music is prohibited between the hours of ten p.m. and eight a.m.
2. Sound emanating from sound-amplifying equipment or live music at any other time shall not be audible to the human ear at a distance greater than two hundred (200) feet from the equipment or music.

(Ord. 847 § 6, 2006)

9.52.070 - Exceptions.

Exceptions may be requested from the standards set forth in Section 9.52.040 or 9.52.060 of this chapter and may be characterized as construction-related, single-event or continuous-events exceptions.

A. Application and Processing.

1. Construction-Related Exceptions. An application for a construction-related exception shall be made to and considered by the director of building and safety on forms provided by the building and safety department and shall be accompanied by the appropriate filing fee. No public hearing is required.
2. Single-Event Exceptions. An application for a single-event exception shall be made to and considered by the planning director on forms provided by the planning department and shall be accompanied by the appropriate filing fee. No public hearing is required.
3. Continuous-Events Exceptions. An application for a continuous-events exception shall be made to the planning director on forms provided by the planning department and shall be accompanied by the appropriate filing fee. Upon receipt of an application for a continuous-events exception, the planning director shall set the matter for public hearing before the planning commission, notice of which shall be given as provided in Section 18.26c of Riverside County Ordinance No. 348. Notwithstanding the above, an application for a continuous-events exception that is associated with an application for a land use permit shall be processed concurrently with the land use permit in the same manner that the land use permit is required to be processed.

B. Requirements for Approval. The appropriate decisionmaking body or officer shall not approve an exception application unless the applicant demonstrates that the activities described in the application would not be detrimental to the health, safety or general welfare of the community. In determining whether activities are detrimental to the health, safety or general welfare of the community, the appropriate decisionmaking body or officer shall consider such factors as the proposed duration of the activities and their location in relation to sensitive receptors. If an exception application is approved, reasonable conditions may be imposed to minimize the public detriment, including, but not limited to, restrictions on sound level, sound duration and operating hours.

C. Appeals. The director of building and safety's decision on an application for a construction-related exception is considered final. The planning director's decision on an application for a single-event exception is considered final. After making a decision on an application for a continuous-events exception, the appropriate decisionmaking body or officer shall mail notice of the decision to the applicant. Within ten (10)

calendar days after the mailing of such notice, the applicant or an interested person may appeal the decision to the board of supervisors. Upon receipt of an appeal and payment of the appropriate appeal fee, the clerk of the board shall set the matter for hearing not less than five days nor more than thirty (30) days thereafter and shall give written notice of the hearing in the same manner as notice of the hearing was given by the appropriate hearing officer or body. The board of supervisors shall render its decision within thirty (30) days after the appeal hearing is closed.

D. Effect of a Pending Continuous-Events Exception Application. For a period of one hundred eighty (180) days from the effective date of this chapter, no person creating any sound prohibited by this chapter shall be considered in violation of this chapter if the sound is related to a use that is operating pursuant to an approved land use permit, if an application for a continuous-events exception has been filed to sanction the sound and if a decision on the application is pending.

(Ord. 847 § 7, 2006)

9.52.080 - Enforcement.

The Riverside County sheriff and code enforcement shall have the primary responsibility for enforcing this chapter; provided, however, the sheriff and code enforcement may be assisted by the public health department. Violations shall be prosecuted as described in Section 9.52.100 of this chapter, but nothing in this chapter shall prevent the sheriff, code enforcement or the department of public health from engaging in efforts to obtain voluntary compliance by means of warnings, notices, or educational programs.

(Ord. 847.1 § 1, 2007: Ord. 847 § 8, 2006)

9.52.090 - Duty to cooperate.

No person shall refuse to cooperate with, or obstruct, the enforcement officials identified in Section 9.52.080 of this chapter when they are engaged in the process of enforcing the provisions of this chapter. This duty to cooperate may require a person to extinguish a sound source so that it can be determined whether sound emanating from the source violates the provisions of this chapter.

(Ord. 847 § 9, 2006)

9.52.100 - Violations and penalties.

Any person who violates any provision of this chapter once or twice within a one hundred eighty (180) day period shall be guilty of an infraction. Any person who violates any provision of this chapter more than twice within a one hundred eighty (180) day period shall be guilty of a misdemeanor. Each day a violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such. Penalties shall not exceed the following amounts:

A. For the first violation within a one hundred eighty (180) day period, the minimum mandatory fine shall be five hundred dollars ($500.00).

B. For the second violation within a one hundred eighty (180) day period, the minimum mandatory fine shall be seven hundred fifty dollars ($750.00).

C. For any further violations within a one hundred eighty (180) day period, the minimum mandatory fine shall be one thousand dollars ($1,000.00) or imprisonment in the county jail for a period not exceeding six months, or both.

(Ord. 847 § 10, 2006)

APPENDIX 3.2:

CITY OF INDIO MUNICIPAL CODE

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CHAPTER 95C: NOISE CONTROL

Section

§ 95C.01 PURPOSE.

It is the purpose of this chapter to implement regulations and general administrative procedure to control and abate unnecessary, excessive and annoying noise and vibration. It is further the purpose of this chapter to recognize that the existence of excessive noise and vibration within the city is a condition that is detrimental to the peace, health, safety, welfare and quality of life of the citizens and shall be regulated in the public interest.

(Ord. 1267, passed 4-5-00)

§ 95C.02 DEFINITIONS.

As used in this chapter, the following terms have the meanings given:

AMBIENT NOISE LEVEL. The all-encompassing noise associated with a given environment being a composite of all sources.

AVERAGE SOUND LEVEL. A sound level typical of the sound levels at a certain place during a given period of time; also, an equivalent continuous sound level.

COMMERCIAL PURPOSES. The use, operation or maintenance of any sound amplifying equipment mounted on a sound truck for the purpose of advertising any business, or any goods, wares, merchandise, or services, and for the purpose of attracting the attention of the public to, or advertising for, or soliciting patronage of customers to or for any performance, show, entertainment, exhibition, or event, or for the purpose of demonstrating any such sound equipment.

CONSTRUCTION EQUIPMENT. Tools, machinery or equipment used in connection with construction operations, including all types of "special construction" equipment as defined in the pertinent sections of California Vehicle Code when used in the construction process on any construction site, home improvement site or property maintenance site, regardless of whether such site is located on highway or off-highway.

DISTURBING, EXCESSIVE OR OFFENSIVE NOISE. Any sound or noise in excess of the sound levels or noise levels set forth in this chapter for permissible noises.

FIXED NOISE SOURCE. A stationary device which creates sound, which is fixed or motionless including, but not limited to, industrial and commercial machinery and equipment, pumps, fans, compressors, generators, air conditioners and refrigeration equipment.

MOBILE NOISE SOURCE. Any noise source other than fixed noise source.

NOISE LEVEL. Is interchangeable with ***SOUND LEVEL***.

NONCOMMERCIAL. The use of, operation or maintenance of any sound equipment for other than a commercial purpose. ***NONCOMMERCIAL PURPOSES*** means and includes, but is not limited to, philanthropic, patriotic, charitable, political or community promotion purposes.

SIMPLE TONE NOISE. Noise characterized by a predominant frequency or frequencies so that other frequencies cannot

be readily distinguished.

SOUND AMPLIFYING EQUIPMENT. Any machine or device for the amplification of the human voice, music or any other sound. ***SOUND AMPLIFYING EQUIPMENT*** shall not be construed as including standard automobile radios when used and heard only by the occupants of the vehicle in which installed or warning devices on authorized emergency vehicles.

SOUND TRUCK. Any motor vehicle or other vehicle regardless of motive power whether in motion or stationary having mounted thereon, built-in or attached thereto any sound amplifying equipment.

(Ord. 1267, passed 4-5-00)

§ 95C.03 GENERAL PROHIBITIONS.

(A) It shall be unlawful for any person to make, continue, or cause to be made or continued, within the city limits or within 200 feet thereof, any disturbing excessive or offensive noise or vibration which causes discomfort or annoyance to any reasonable person of normal sensitivity in the area or that is plainly audible at a distance greater than 50 feet from the source point for any purpose.

(B) The characteristics and conditions which should be considered in determining whether a violation of the provisions of this section exists should include, but are not limited to the following:

(1) The level of the noise;

(2) Whether the nature of the noise is usual or unusual;

(3) Whether the origin of the noise is natural or unnatural;

(4) The level of the ambient noise;

(5) The proximity of the noise to sleeping facilities;

(6) The nature and zoning of the area from which the noise emanates and the area where it is received;

(7) The time of day or night the noise occurs;

(8) The duration of the noise; and

(9) Whether the noise is recurrent, intermittent, or constant.

(Ord. 1267, passed 4-5-00)

§ 95C.04 DISTURBING, EXCESSIVE, OFFENSIVE NOISES; DECLARATION OF CERTAIN ACTS CONSTITUTING.

The following activities, among others, are declared to cause disturbing, excessive or offensive noises in violation of this chapter and Chapter 95A and are unlawful, namely:

(A) *Horns, Signaling Devices, and the like.* Unnecessary use or operation of horns, signaling devices, or other similar devices, on automobiles, motorcycles, or any other vehicle.

(B) *Radios, Television Sets, Phonographs, Loud Speaking Amplifiers and Similar Devices.*

(1) *Uses Restricted.* The use or operation of any sound production or reproduction device, radio receiving set, musical instrument, drums, phonograph, television set, loud speakers, sound amplifier or other similar machine or device for the producing or reproducing of sound in such a manner as to disturb the peace, quiet, or comfort of any reasonable person of normal sensitivity in any area of the city is prohibited.

(2) *Prima Facie Violations.* Any of the following shall constitute evidence of a prima facie violation of this section:

(a) The operation of any such sound production or reproduction device, radio receiving set, musical instrument, drum, phonograph, television set, machine, loud speaker and sound amplifier or similar machine or device in such a manner as to be plainly audible at a distance of 50 feet from the building, structure or vehicle in which located, or from the source point.

(b) The operation of any sound amplifier, which is part of, or connected to, any radio, stereo receiver, compact disc player, cassette tape player, or other similar device when operated in such a manner as to be plainly audible at a distance of 50 feet from the source point or when operated in such a manner as to cause a person to be aware of vibration at a distance of 50 feet from the source point.

(3) *Enforcement of Prima Facie violations.*

(a) Any person who is authorized to enforce the provisions of this chapter and who encounters evidence of a prima facie violation of this section is empowered to confiscate and impound as evidence, any or all of the components amplifying or transmitting the sound.

(b) Any peace officer, as defined in Cal. Penal Code, Ch. 4.5 §§ 830 et seq., who encounters evidence of a prima facie violation of this section whereby the component(s) amplifying or transmitting the sound are attached to a vehicle may, in accordance with the provisions of Cal. Veh. Code § 22655.5, impound the vehicle, as containing evidence of a criminal offense, when the amplifying and/or transmitting component(s) cannot be readily removed from the vehicle without damaging the component(s) or vehicle.

(C) *Animals.*

(1) Notwithstanding the provisions of § 92.08 (E) of this code, it shall be unlawful for any person having charge, care, custody, or control of any animal to keep, maintain, or to permit to be kept or maintained upon any premises owned, occupied, or controlled by any person to permit such animal to emit any excessive noise which is disturbing or offensive. Excessive noise includes, but is not limited to, loud persistent or habitual dog barking, howling, or yelping.

(2) No person, after being informed orally or in writing that his dog or other animal has by barking or other noise or sound disturbed any other person's peace and quiet, shall fail, refuse or neglect to take whatever steps or use whatever means are necessary to assure that the dog or animal does not again disturb the other person's peace and quiet.

(3) The Noisy Animal Petition shall include a description of the noisy animal(s), the name, address, and telephone number of the complainant, as well as the address of the animal owner, person having charge of the animal, or custodian of the animal and a description of the noise.

(4) The city shall enforce this chapter as follows:

(a) Upon receiving a Noisy Animal Petition complaint involving whining, barking, howling, screeching or similar animal noise, the city shall cause the following to be performed:

1. The Enforcement Officer will advise the owner or person in charge of the animal by mail or personal service, to quiet the animal within 72 hours of the notification, and failure to comply with the order may result in the matter being referred to the District Attorney or City Attorney for litigation.

2. 72 hours after the notification has been made the Enforcement Officer shall re-contact the complainant who filed the Noisy Animal Petition to see if the problem has been resolved.

a. If the problem has been resolved there shall be no further action and the Noisy Animal Petition shall be kept on file for a period of one year.

b. If the noisy animal has not been quieted and the situation has not been resolved at the end of this 72 hour period, a citation shall be issued to either the animal owner, person having charge of the animal, or custodian of the animal.

(b) Upon receipt of a subsequent Noisy Animal Petition being filed within six months to the same animal owner, person having charge of the animal, or custodian of the animal for the same violation, the Animal Control Officer shall issue a citation to either the animal owner, person having charge of the animal, or custodian of the animal for violation of this chapter.

(5) A habitually barking dog or other animal may be ordered removed from the incorporated area of the city as a public nuisance, in accordance with Chapter 95A of this code, by the Police Department, Animal Control Supervisor, Code Enforcement Supervisor or his or her designee if he or she has such evidence to show that the animal is a threat to the health, safety, general welfare or peace and quiet of the general public.

(D) *Hospitals, Schools, Libraries, Rest Homes, Long-Term Medical or Mental Care Facilities.* To make noise adjacent to a hospital, school, library, rest home, or long-term medical or mental care facility, which noise reasonably interferes with the workings of such institutions or which disturbs or unduly annoys occupants in said institutions.

(E) *Playing of Radios on Buses, Public Transportation.* The operation of any radio, phonograph, or tape player on an urban transit bus or trolley so as to emit noise that is audible to any other person in the vehicle is prohibited.

(F) *Leaf Blowers.*

(1) A ***LEAF BLOWER*** means any portable, hand held or back pack, engine powered device with a nozzle that creates a directable airstream which is capable of and intended for moving leaves and light materials.

(2) Leaf blowers shall only be operated between the hours of 7:00 a.m. and 8:00 p.m. on any day except on Sunday when they may only be operated between the hours of 10:00 a.m. and 8:00 p.m.

(3) Leaf blowers shall be equipped with functional mufflers and an approved sound limiting device required to ensure that the leaf blower is not capable of generating a sound level exceeding any limit prescribed in this chapter.

(G) *Yelling, Shouting, etc.* Yelling, shouting, hooting, whistling or singing on the public streets or on any publicly owned property between the hours of 10:00 p.m. and 8:00 a.m., or at any time or place so as to disturb the quiet comfort or repose of persons in any office, or in any dwelling, hotel or other type of residence or persons in the close proximity shall be considered a violation of this section.

(Ord. 1267, passed 4-5-00)

§ 95C.05 BURGLAR ALARMS.

(A) Audible burglar alarms for structures or motor vehicles are prohibited unless the operation of such burglar alarm will be terminated within ten minutes of being activated.

(B) Notwithstanding the requirements of this chapter, any member of the Police Department of the city shall have the right to take such steps as may be reasonable and necessary to disconnect any such alarm installed in any building, dwelling, or motor vehicle at any time during the period of its activation. This section does not preclude the towing and

storage of vehicles in accordance with the procedures set forth in the Cal. Veh. Code § 22651.5.

(Ord. 1267, passed 4-5-00)

§ 95C.06 SOUND TRUCK–COMMERCIAL AND NONCOMMERCIAL.

(A) No person shall use, or cause to be used, a sound truck with its sound amplifying equipment in operation for commercial or noncommercial purposes in the city, before filing a written Sound Truck Registration statement with the city Business Licensing Department.

(B) Preexisting commercial and non-commercial sound trucks operating in the city prior to the date of adoption of the ordinance codified in this chapter shall be granted a 60 day period from the date of adoption within which to comply with the provisions of this chapter and file a Sound Truck Registration form with the city Business Licensing Clerk.

(C) This Sound Truck Registration statement shall be filed in duplicate and shall state the following:

(1) Name and home address of the applicant;

(2) Address of place of business of applicant;

(3) License number and motor number of the sound truck to be used by applicant;

(4) Name and address of person who owns the sound truck;

(5) Name and address of person having direct charge of the sound truck;

(6) Names and addresses of all persons who will use or operate the sound truck;

(7) The purpose for which the sound truck will be used;

(8) A general statement as to the section or sections of the city in which the sound truck will be used;

(9) The proposed hours of operation of the sound truck;

(10) The number of days of proposed operation of the sound truck;

(11) Proof of current liability insurance;

(12) A general description of the sound amplifying equipment which is to be used;

(13) The maximum sound producing power of the sound amplifying equipment to be used in or on the sound truck as follows:

(a) The wattage to be used;

(b) The volume in decibels of the sound which will be produced;

(c) The approximate maximum distance which sound will be thrown from the sound truck.

(D) All persons using, or causing to be used, sound trucks for commercial and noncommercial purposes shall amend any registration statement filed pursuant to division (A) within 48 hours after any change in the information therein furnished.

(E) The Business Licensing Clerk shall return to each applicant under division (A) herein, one copy of the registration statement duly certified as a correct copy of the application. The certified copy of the application shall be in the possession of any person operating the sound truck at all times while the sound truck's sound amplifying equipment is in operation and the copy shall be presented to any enforcement officer of the city upon request.

(F) Noncommercial and commercial use of sound trucks in the city with sound amplifying equipment in operation shall be subject to the following regulations:

(1) The only sounds permitted are music or human speech;

(2) Operations are permitted during daylight hours each day. No sound amplifying equipment shall be used during hours of darkness. ***DARKNESS*** is defined as any time from one-half hour after sunset to one-half hour before sunrise and any other time when visibility is not sufficient to render clearly discernable any person or vehicle on the roadway at a distance of 1,000 feet;

(3) Sound amplifying equipment shall only be operated when the sound truck upon which such equipment is mounted is operated at a speed of at least ten miles per hour. When stationary the sound amplifying equipment shall not be operated;

(4) Sound amplification equipment shall not be operated within 100 yards of hospitals, schools, churches, courthouses, or polling places;

(5) The human speech and music amplified shall not be profane, lewd, indecent, or slanderous;

(6) The volume of sound shall be controlled so that it will not be plainly audible for a distance in excess of 50 feet from the sound truck and so that the volume is not unreasonably loud, raucous, jarring, disturbing, or a nuisance to persons within the area of audibility;

(7) No sound amplifying equipment shall be operated with an excess of 15 watts of power in the last state of amplification; and

(8) Sound amplifying equipment shall not exceed a threshold sound output of 70 decibels when measured at a distance of ten feet. The measurement is to be taken directly in front of the primary output source.

(Ord. 1267, passed 4-5-00)

§ 95C.07 PROHIBITED CONDUCT FOR COMMERCIAL SOUND TRUCKS; FOOD VENDORS.

Notwithstanding the provisions of Chapter 114 of this code, it shall be unlawful for any person including, but not limited to vending truck operators to sound, blow or operate any music, chimes or bells, or any similar sound device amplified or otherwise, that can be heard for a distance greater than 50 feet for any purpose.

(Ord. 1267, passed 4-5-00)

§ 95C.08 DISTURBING, EXCESSIVE, OFFENSIVE NOISES OR VIBRATION CREATED BY VEHICLE(S), TOOLS, MACHINERY; DECLARATION OF CERTAIN ACTS CONSTITUTING.

The following activities, among others, are declared to cause disturbing, excessive or offensive noises or vibration in violation of this section but such enumeration shall not be deemed to be exclusive, namely:

(A) *Standing motor vehicles.* No person shall operate or permit the operation of any motor vehicle with a gross vehicle weight rating in excess of 10,000 pounds, or any auxiliary equipment attached to such a vehicle, including but not limited to refrigerated truck compressors, for a period longer than 15 minutes in any hour while the vehicle is stationary and on a public right-of-way or public space, within 150 feet of a residential area between the hours of 7:00 p.m. and 7:00 a.m., except when movement of said vehicle is restricted by other traffic.

(B) *Controlled hours of operation.* Notwithstanding the provisions of Chapter 151 of this code it shall be unlawful for any person to operate, permit, use or cause to operate, any of the following:

(1) Powered model vehicles/planes;

(2) Loading and unloading of vehicles, operating of fork lifts or cranes within 1,000 feet of a residence [exempted if distance from residential area exceeds 1,000 feet or as it may be reduced by the Planning Commission subject to design review or conditional use permit]; and

(3) Construction tools and machinery.

Other than between the hours of:

(1) *Pacific Standard Time.*

(a) Monday through Friday, 7:00 a.m. through 6:00 p.m.

(b) Saturday, 8:00 a.m. through 6:00 p.m.

(c) Sunday, 9:00 a.m. through 5:00 p.m.

(d) Government Holidays, 9:00 a.m. through 5:00 p.m.

(2) *Pacific Daylight Time.*

(a) Monday through Friday, 6:00 a.m. through 6:00 p.m.

(b) Saturday, 7:00 a.m. through 6:00 p.m.

(c) Sunday, 9:00 a.m. through 5:00 p.m.

(d) Government Holidays, 9:00 a.m. through 5:00 p.m.

(Ord. 1267, passed 4-5-00; Am. Ord. 1477, passed 9-20-06)

§ 95C.09 SPECIAL PROVISIONS; EXEMPTIONS.

The following activities shall be exempted from the provisions of this chapter:

(A) Those noise events in the community (e.g. arterial traffic noise, railroad noise) that are more accurately measured by application of the general plan noise element policy, utilizing the community noise equivalent level (CNEL) method.

(B) School bands, school athletic and school entertainment events.

(C) Outdoor gatherings, public dances, shows and sporting and entertainment events provided said events are authorized by the city via permit, or previously approved development agreement.

(D) Activities conducted in public parks and public playgrounds with a valid city permit.

(E) Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle or work.

(F) All mechanical devices, apparatus or equipment which are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions.

(G) Mobile noise sounds associated with agricultural operations provided such operations do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a Federal holiday.

(H) Mobile noise sources associated with agricultural pest control through pesticide application.

(I) The provisions of this chapter shall not preclude the construction, operation, maintenance and repairs of equipment, apparatus or facilities of park and recreation departments, public work projects or essential public services and facilities, including trash collection and those activities of public utilities subject to the regulatory jurisdiction of the California Public Utilities Commission.

(J) The provisions of this chapter shall not apply to noise sources associated with minor maintenance or improvement of property used either in part or in whole for residential purposes provided said activities take place between the hours of 7:00 a.m. and 8:00 p.m. on any day except Sunday or between the hours of 10:00 a.m. and 8:00 p.m. on Sunday.

(K) The provisions of this chapter shall not apply to any activity to the extent regulation thereof has been preempted by state or federal law or which is necessary or appropriate means of complying with health or safety requirements imposed by state or federal law.

(L) If at the time the enforcement officer investigates a noisy animal(s) complaint, and determines that the cause of the noise is the result of a person, other than the animal's owner or caretaker, committing or attempting to commit an illegal act, such as trespass or theft, no violation of § 95C.04 shall have taken place.

(Ord. 1267, passed 4-5-00)

§ 95C.10 ENFORCEMENT PROCEDURES.

The city shall enforce this chapter as follows:

(A) Upon receiving a complaint of a violation or evidence of a prima facie violation of this chapter the city shall cause the following to be performed:

(1) The Enforcement Officer shall respond to the complainant's location and verify if the disruptive noise is still occurring. If the disruptive noise is present, the Enforcement Officer shall serve as a witness to the violation. If the noise has ceased, the Enforcement Officer shall have the complainant complete and sign a Declaration of Violation statement.

(2) The Enforcement Officer will advise the owner or person causing the disturbing noise and advise him or her of the complaint. The Enforcement Officer will advise the owner or person causing the noise that he or she is in violation of the City of Indio Noise Ordinance.

(3) The Enforcement Officer will issue a written Noise Warning Notice to abate the disturbing noise. The Noise Warning Notice will be in writing and will contain the following:

Notice: Noise Complaint Response By The City of Indio. This notice of violation given to (NAME) (DOB) at (LOCATION) on (DATE) (TIME) (PHONE NUMBER) is the result of a disruptive noise complaint in accordance with the City of Indio Code of Ordinance Chapter 95A and/or Chapter 95C. You are asked to cease and desist from making any disruptive noises in violation of the City of Indio Code of Ordinances. A second response to this location within thirty (30) days for the same violation may result in a citation being issued and can also result in a service charge to you for the City's actual costs expended in personnel and equipment for a subsequent return to the location.

(4) If the problem has been resolved there shall be no further action and the Noise Warning Notice shall be kept on file for a period of 30 days.

(5) If after issuing the Noise Warning Notice an Enforcement Officer has prima facie evidence of a violation or upon receiving a complaint is required to respond to the same location a second time for the same violation within 30 days the owner or person causing the disturbing noise shall be issued a citation. The owner or person causing the disturbing noise may be held liable for the service fee charge of the city's actual costs expended in personnel and equipment for the second and subsequent responses.

(B) *Second response costs and joint and several liability.* The costs for the second response may include damage to city property and/or injuries to city personnel, and shall be computed as outlined in § 33.100*et seq.*, as amended from time to time, but shall in no case be less than $100. The costs charged pursuant to this section shall be a personal obligation of the owner or person causing the disturbing noise, or if that person is a minor, then the parent(s) or guardian(s) of that minor.

(Ord. 1267, passed 4-5-00)

§ 95C.11 ENFORCEMENT AUTHORITY.

The Police Department, the Building Department and/or Business Licensing Department shall have the power and authority and duty to enforce any and all provisions of this chapter.

(Ord. 1267, passed 4-5-00)

§ 95C.12 VIOLATION; INFRACTIONS.

Any person violating any of the provisions of this chapter shall be deemed guilty of an infraction.

(Ord. 1267, passed 4-5-00)

§ 95C.13 CONTINUING OR SUBSEQUENT VIOLATIONS; MISDEMEANOR.

Any person having been convicted of a violation of any provisions of this chapter who thereafter commits a violation of the same provisions of this chapter may be prosecuted, at the discretion of the City Attorney, as either an infraction or as a misdemeanor, punishable by a fine not exceeding $1,000, or imprisonment in the county jail for a term not exceeding six months, or by both such fine and imprisonment.

(Ord. 1267, passed 4-5-00)

§ 95C.14 EXCESSIVE NOISE AND VIBRATION FROM VEHICLES.

(A) Notwithstanding anything to the contrary in this chapter, when the source point of the excessive noise and/or vibration is located in or emanates from a vehicle, any violation of § 95C.04(B)(2) of this chapter shall constitute a misdemeanor.

(B) This section shall not apply to vehicles exempted by §95C.09 of this chapter.

(Ord. 1299, passed 8-1-01)

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APPENDIX 5.1:

STUDY AREA PHOTOS

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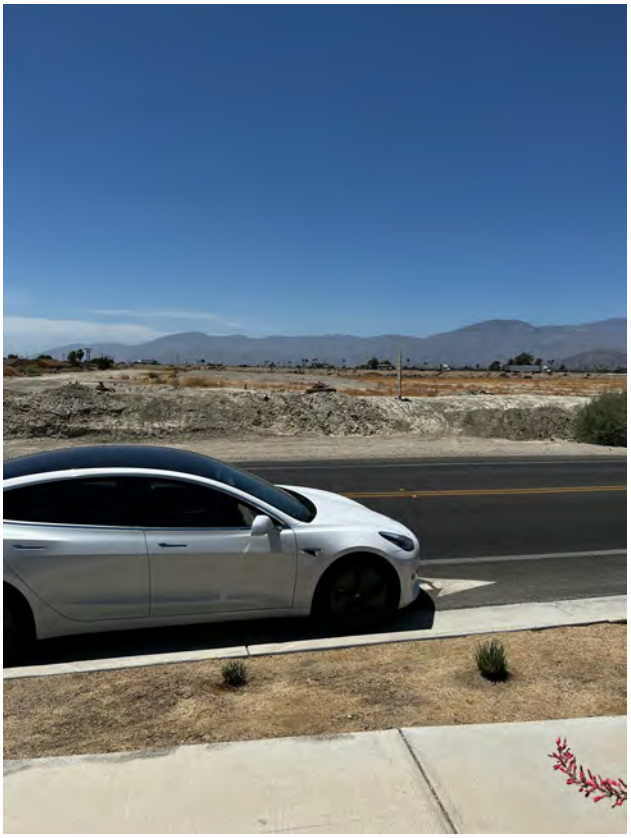
JN: 14744 Ave 42 / Calhoun St

14744_L1_S_3.East
33, 44' 12.620000"116, 12' 43.930000"

14744_L1_S_4.West
33, 44' 12.620000"116, 12' 43.960000"

14744_L2_Z_1.North
33, 44' 12.720000"116, 12' 29.930000"



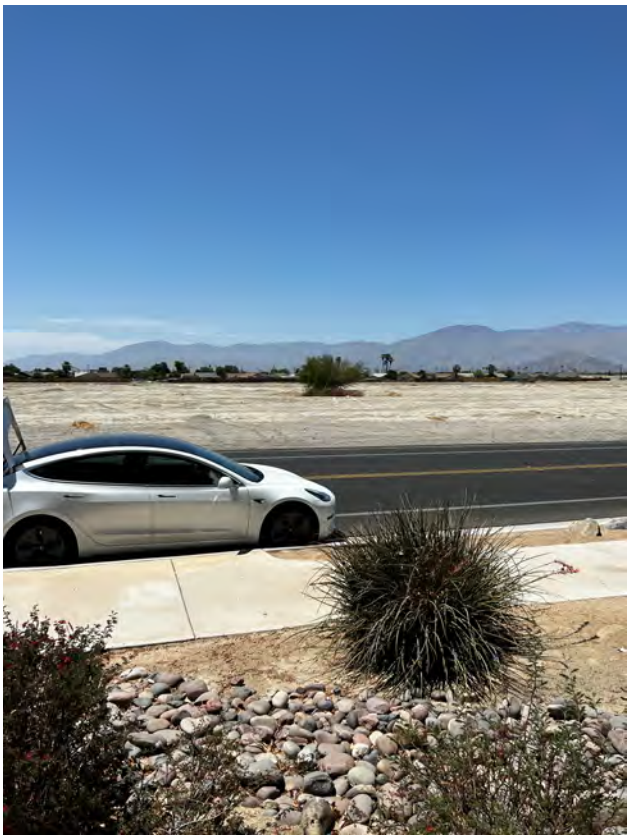
14744_L2_Z_2.South
33, 44' 12.720000"116, 12' 29.950000"

JN: 14744 Ave 42 / Calhoun St

14744_L2_Z_3.East
33, 44' 12.700000"116, 12' 29.950000"

14744_L2_Z_4.West
33, 44' 12.690000"116, 12' 29.980000"

14744_L3_H_1.North
33, 44' 12.770000"116, 12' 17.290000"



14744_L3_H_2.South
33, 44' 12.720000"116, 12' 17.210000"

JN: 14744 Ave 42 / Calhoun St

14744_L3_H_3.East
33, 44' 12.740000"116, 12' 17.180000"

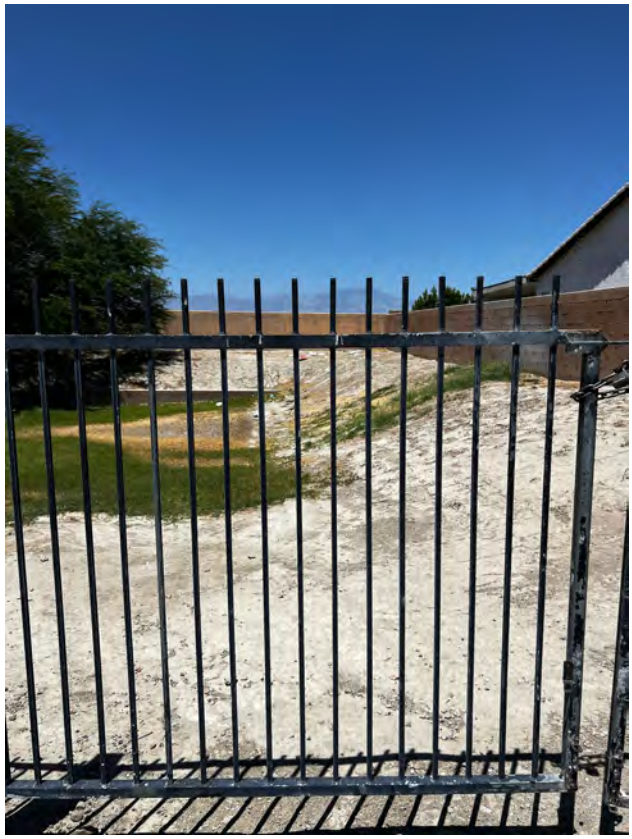
14744_L3_H_4.West
33, 44' 12.740000"116, 12' 17.240000"

14744_L4_A_1.North
33, 44' 3.670000"116, 12' 12.380000"

14744_L4_A_2.South
33, 44' 3.620000"116, 12' 12.350000"

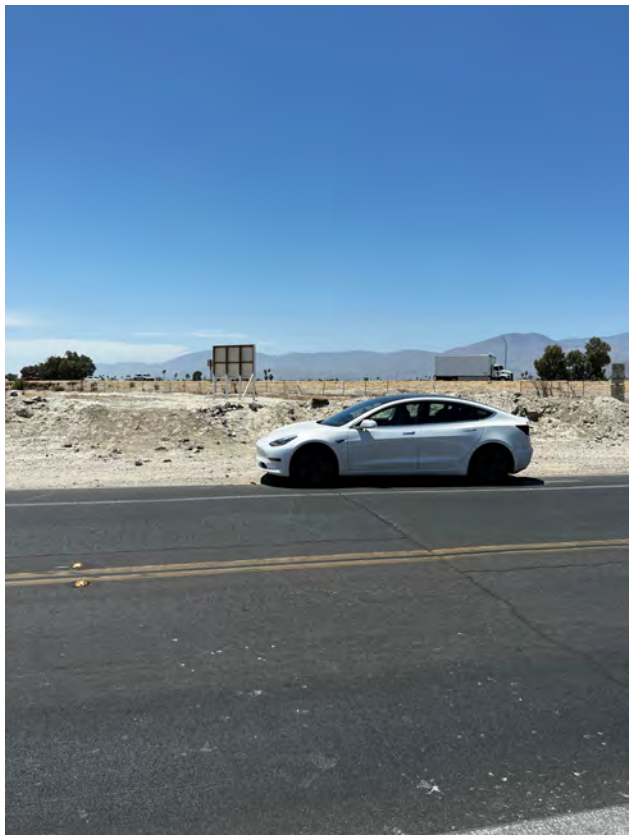
JN: 14744 Ave 42 / Calhoun St

14744_L4_A_3.East
33, 44' 3.530000"116, 12' 12.350000"



14744_L4_A_4.West
33, 44' 3.550000"116, 12' 12.380000"

14744_L1_S_1.North
33, 44' 12.650000"116, 12' 43.930000"



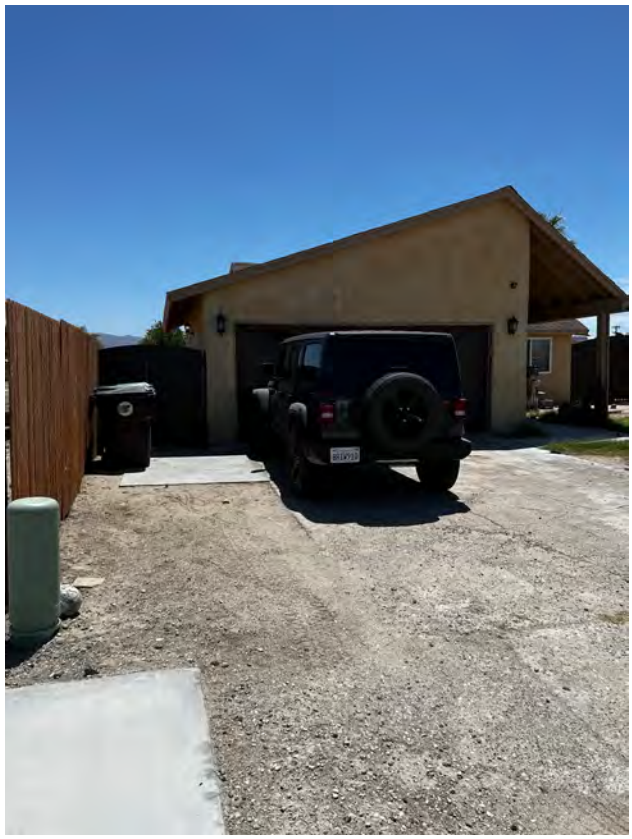
14744_L1_S_2.South
33, 44' 12.620000"116, 12' 43.930000"

JN: 14744 Ave 42 / Calhoun St

14744_L5_G_1.North
33, 44' 2.740000"116, 12' 17.980000"

14744_L5_G_2.South
33, 44' 2.580000"116, 12' 17.950000"

14744_L5_G_3.East
33, 44' 2.710000"116, 12' 18.040000"

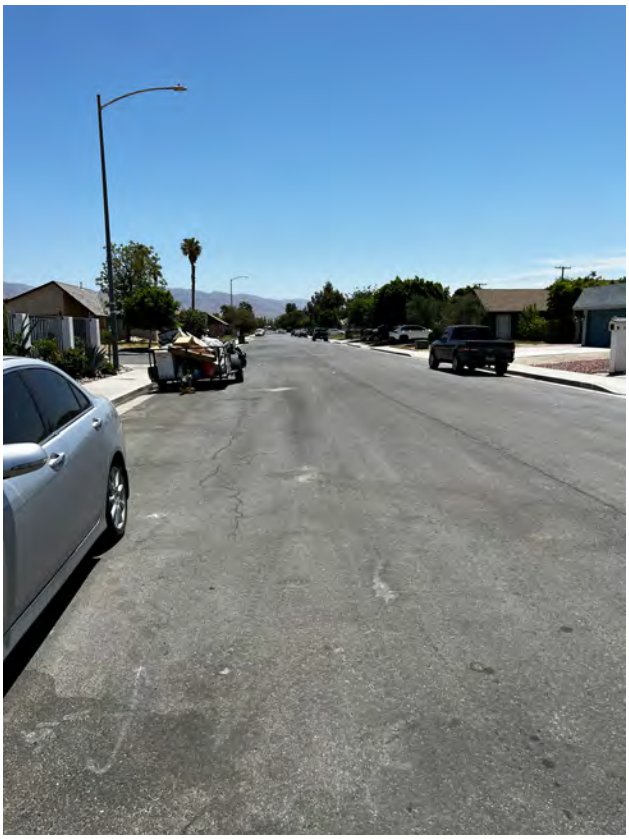


14744_L5_G_4.West
33, 44' 2.720000"116, 12' 17.980000"

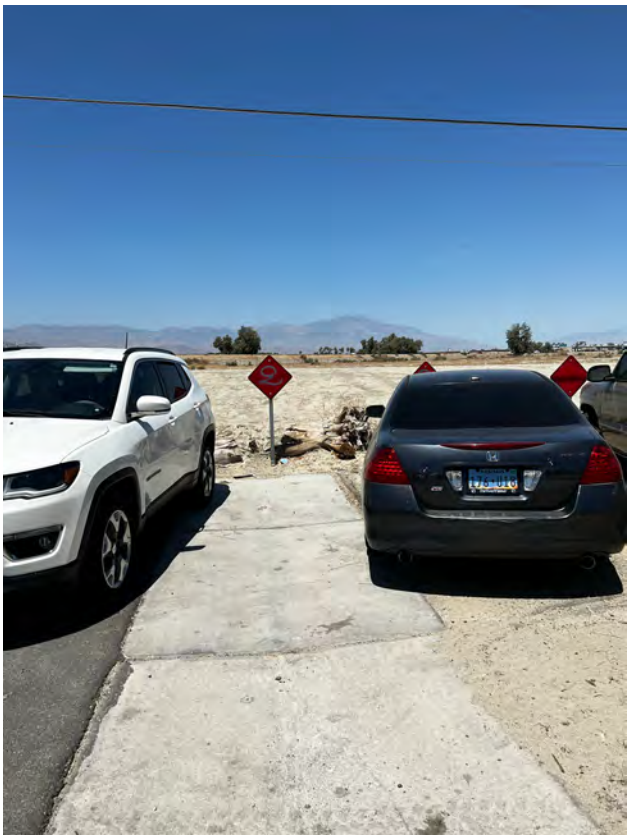
JN: 14744 Ave 42 / Calhoun St

14744_L6_W_1.North
33, 44' 0.510000"116, 12' 28.610000"

14744_L6_W_2.South
33, 44' 0.510000"116, 12' 28.610000"



14744_L6_W_3.East
33, 44' 0.510000"116, 12' 28.610000"



14744_L6_W_4.West
33, 44' 0.510000"116, 12' 28.750000"

JN: 14744 Ave 42 / Calhoun St

14744_L7_Y_1.North
33, 43' 57.710000"116, 12' 28.880000"

14744_L7_Y_2.South
33, 43' 57.710000"116, 12' 29.020000"

14744_L7_Y_3.East
33, 43' 57.650000"116, 12' 28.880000"

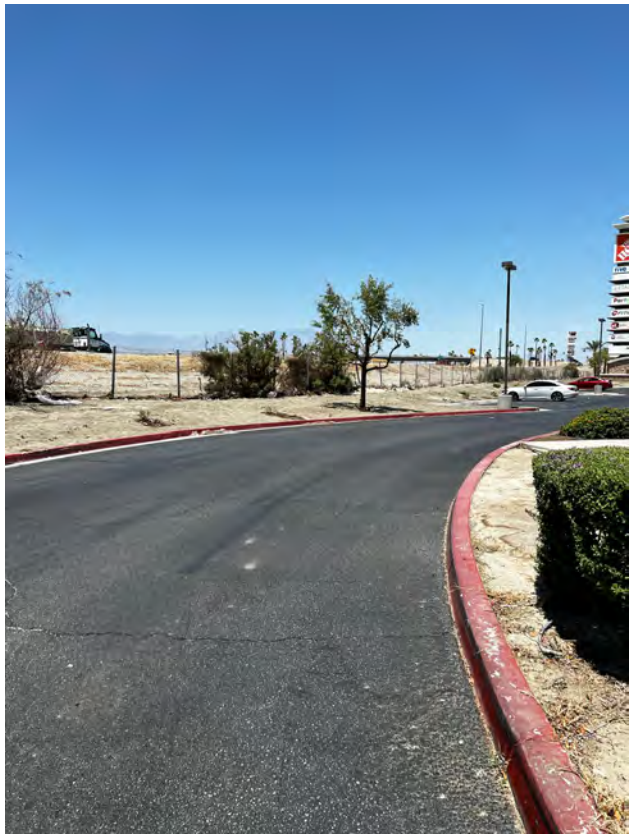
14744_L7_Y_4.West
33, 43' 57.680000"116, 12' 28.940000"

JN: 14744 Ave 42 / Calhoun St

14744_L8_J_1.North
33, 44' 12.940000"116, 12' 47.200000"

14744_L8_J_2.South
33, 44' 12.890000"116, 12' 47.200000"

14744_L8_J_3.East
33, 44' 12.880000"116, 12' 47.150000"



14744_L8_J_4.West
33, 44' 12.880000"116, 12' 47.200000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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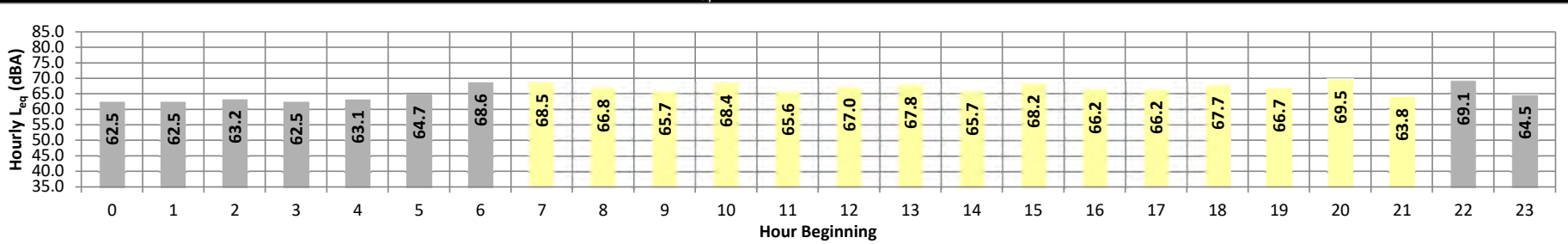
24-Hour Noise Level Measurement Summary

Date: Friday, June 10, 2022 | *Location:* L1 - Near La Fitness located at 42900 Jackso Street | *Meter:* Piccolo II | *JN:* 14744

Project: AVE 43 / Calhoun St. | *Source:* | *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*	*L_{eq}*	*Adj.*	*Adj. L_{eq}*
Night	0	62.5	68.3	55.5	67.9	67.6	66.8	66.0	63.7	61.4	57.2	56.3	55.7	62.5	10.0	72.5
	1	62.5	68.4	55.3	68.1	67.8	67.0	66.1	63.8	61.3	56.8	56.1	55.5	62.5	10.0	72.5
	2	63.2	70.0	54.3	69.6	69.1	67.8	66.8	64.5	61.9	56.7	55.5	54.5	63.2	10.0	73.2
	3	62.5	68.1	54.5	67.9	67.6	66.9	66.2	63.8	61.2	56.4	55.3	54.6	62.5	10.0	72.5
	4	63.1	69.0	55.9	68.7	68.2	67.4	66.8	64.2	61.9	57.7	56.8	56.1	63.1	10.0	73.1
	5	64.7	71.0	58.1	70.6	70.2	68.9	67.8	65.7	63.6	59.8	59.0	58.3	64.7	10.0	74.7
	6	68.6	78.9	60.9	78.4	77.7	75.0	73.0	67.4	65.6	62.4	61.7	61.1	68.6	10.0	78.6
Day	7	68.5	80.1	58.6	79.8	79.4	75.3	72.2	65.9	63.8	60.1	59.4	58.7	68.5	0.0	68.5
	8	66.8	73.9	61.5	73.6	73.2	71.4	70.0	67.1	65.6	62.8	62.2	61.7	66.8	0.0	66.8
	9	65.7	72.3	60.0	72.0	71.6	70.2	69.3	66.2	64.5	61.4	60.7	60.1	65.7	0.0	65.7
	10	68.4	79.9	60.0	79.4	78.5	75.1	71.6	66.3	64.5	61.3	60.7	60.1	68.4	0.0	68.4
	11	65.6	71.7	60.1	71.4	71.0	69.7	68.6	66.3	64.7	61.5	60.8	60.2	65.6	0.0	65.6
	12	67.0	77.3	59.3	76.6	76.3	73.3	70.7	66.2	64.1	60.9	60.1	59.5	67.0	0.0	67.0
	13	67.8	79.1	59.7	78.5	77.9	74.1	71.3	66.3	64.5	61.4	60.6	59.9	67.8	0.0	67.8
	14	65.7	73.2	59.9	72.9	72.4	70.5	68.7	66.1	64.4	61.4	60.7	60.0	65.7	0.0	65.7
	15	68.2	79.8	60.2	79.2	78.2	74.6	71.4	66.3	64.7	61.7	61.1	60.3	68.2	0.0	68.2
	16	66.2	75.8	59.2	75.1	74.3	71.8	69.7	65.9	64.0	60.8	60.0	59.3	66.2	0.0	66.2
	17	66.2	73.7	60.4	73.5	73.1	71.6	70.1	66.2	64.5	61.7	61.0	60.5	66.2	0.0	66.2
	18	67.7	76.7	60.9	76.4	75.9	73.9	71.6	67.1	65.4	62.4	61.7	61.0	67.7	0.0	67.7
	19	66.7	74.8	61.0	74.4	73.8	71.5	69.9	67.1	65.0	62.2	61.7	61.2	66.7	5.0	71.7
	20	69.5	81.8	58.3	81.5	80.9	76.8	73.1	65.8	63.5	59.8	59.1	58.5	69.5	5.0	74.5
	21	63.8	70.9	56.6	70.5	70.1	68.6	67.5	64.6	62.3	58.3	57.5	56.8	63.8	5.0	68.8
Night	22	69.1	81.2	56.2	80.6	79.4	76.9	74.5	65.8	61.9	58.0	57.1	56.4	69.1	10.0	79.1
	23	64.5	75.9	54.9	75.0	73.9	71.1	68.6	63.3	61.1	56.9	55.9	55.1	64.5	10.0	74.5

Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	63.8	70.9	56.6	70.5	70.1	68.6	67.5	64.6	62.3	58.3	57.5	56.8
	Max	69.5	81.8	61.5	81.5	80.9	76.8	73.1	67.1	65.6	62.8	62.2	61.7
Energy Average		67.1	Average:		75.6	75.1	72.6	70.4	66.2	64.4	61.2	60.5	59.9
Night	Min	62.5	68.1	54.3	67.9	67.6	66.8	66.0	63.3	61.1	56.4	55.3	54.5
	Max	69.1	81.2	60.9	80.6	79.4	76.9	74.5	67.4	65.6	62.4	61.7	61.1
Energy Average		65.3	Average:		71.9	71.3	69.8	68.4	64.7	62.2	58.0	57.1	56.3

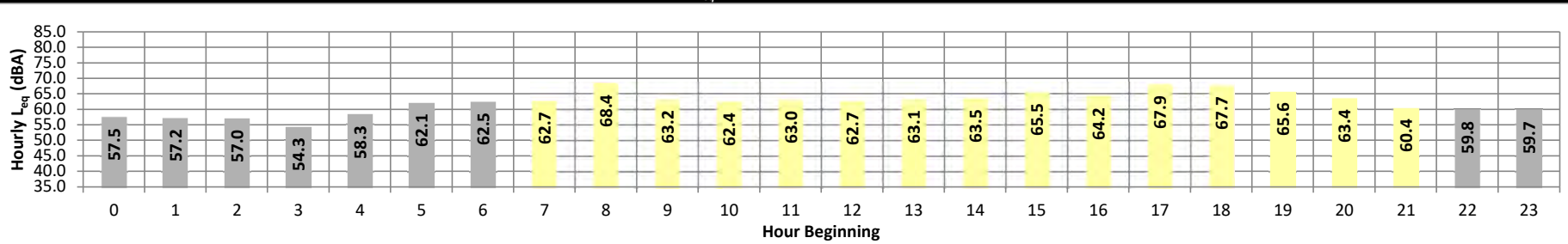
L_{eq} (dBA)		
24-Hour (CNEL)	*Daytime (7am-10pm)*	*Nighttime (10pm-7am)*
72.4	**67.1**	**65.3**

24-Hour Noise Level Measurement Summary

Date: Friday, June 10, 2022 *Location:* L2 - Near existing residence located at 483279 White Stallion *Meter:* Piccolo II *JN:* 14744

Project: AVE 43 / Calhoun St. *Source:* Road. *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	57.5	65.8	53.5	65.5	64.9	62.7	60.9	56.8	55.7	54.1	53.9	53.6	57.5	10.0	67.5
	1	57.2	61.8	53.9	61.6	61.3	60.1	59.2	57.8	56.7	54.8	54.5	54.0	57.2	10.0	67.2
	2	57.0	67.5	50.9	66.9	65.7	62.7	60.5	55.8	54.5	52.1	51.6	51.1	57.0	10.0	67.0
	3	54.3	63.0	49.1	62.7	62.2	60.0	57.9	54.1	51.8	49.9	49.5	49.2	54.3	10.0	64.3
	4	58.3	67.5	54.8	67.0	66.1	63.0	60.9	57.5	56.6	55.4	55.2	55.0	58.3	10.0	68.3
	5	62.1	73.2	53.2	72.8	72.0	69.1	67.4	58.9	56.1	54.1	53.7	53.4	62.1	10.0	72.1
	6	62.5	73.1	55.4	72.7	71.9	68.9	66.5	61.4	58.5	56.3	55.9	55.5	62.5	10.0	72.5
Day	7	62.7	74.0	51.3	73.5	72.8	70.1	68.2	60.9	55.7	52.2	51.8	51.4	62.7	0.0	62.7
	8	68.4	81.2	55.8	80.8	79.9	76.4	72.5	63.6	59.5	56.7	56.3	55.9	68.4	0.0	68.4
	9	63.2	74.3	53.2	73.9	73.1	70.5	68.3	61.4	57.1	54.1	53.7	53.3	63.2	0.0	63.2
	10	62.4	73.2	50.9	72.7	71.9	69.5	67.7	61.8	55.8	51.8	51.3	51.0	62.4	0.0	62.4
	11	63.0	73.6	51.4	73.1	72.3	69.8	68.3	62.8	57.0	52.4	51.9	51.5	63.0	0.0	63.0
	12	62.7	72.4	51.0	72.0	71.3	69.2	67.8	63.2	57.5	51.9	51.5	51.1	62.7	0.0	62.7
	13	63.1	73.3	51.8	72.8	72.0	69.6	68.2	63.4	57.8	52.9	52.4	52.0	63.1	0.0	63.1
	14	63.5	74.4	52.1	74.0	73.1	70.6	68.6	62.5	57.5	53.2	52.7	52.2	63.5	0.0	63.5
	15	65.5	77.9	51.8	77.2	76.2	73.1	69.5	63.6	58.3	52.8	52.3	51.9	65.5	0.0	65.5
	16	64.2	74.9	51.8	74.5	73.8	71.3	69.5	63.8	57.8	53.0	52.4	51.9	64.2	0.0	64.2
	17	67.9	81.0	53.4	80.5	79.4	75.7	71.8	64.4	59.5	54.5	53.9	53.5	67.9	0.0	67.9
	18	67.7	81.0	54.5	80.4	79.2	73.9	70.5	64.9	60.1	55.5	55.1	54.6	67.7	0.0	67.7
	19	65.6	76.6	55.4	76.4	76.0	73.0	69.7	64.3	60.1	56.4	56.0	55.6	65.6	5.0	70.6
	20	63.4	75.4	51.0	74.9	73.8	70.5	67.8	61.9	57.0	52.1	51.6	51.1	63.4	5.0	68.4
	21	60.4	70.8	48.3	70.3	69.7	67.4	65.6	60.0	54.6	49.4	48.9	48.4	60.4	5.0	65.4
Night	22	59.8	70.7	50.0	70.3	69.7	67.2	64.9	58.3	53.2	50.8	50.5	50.1	59.8	10.0	69.8
	23	59.7	70.4	48.7	69.9	69.4	67.5	65.9	57.0	52.7	49.8	49.4	48.9	59.7	10.0	69.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	60.4	70.8	48.3	70.3	69.7	67.4	65.6	60.0	54.6	49.4	48.9	48.4
	Max	68.4	81.2	55.8	80.8	79.9	76.4	72.5	64.9	60.1	56.7	56.3	55.9
Energy Average		64.9	Average:		75.1	74.3	71.4	68.9	62.8	57.7	53.3	52.8	52.4
Night	Min	54.3	61.8	48.7	61.6	61.3	60.0	57.9	54.1	51.8	49.8	49.4	48.9
	Max	62.5	73.2	55.4	72.8	72.0	69.1	67.4	61.4	58.5	56.3	55.9	55.5
Energy Average		59.4	Average:		67.7	67.0	64.6	62.7	57.5	55.1	53.0	52.7	52.3

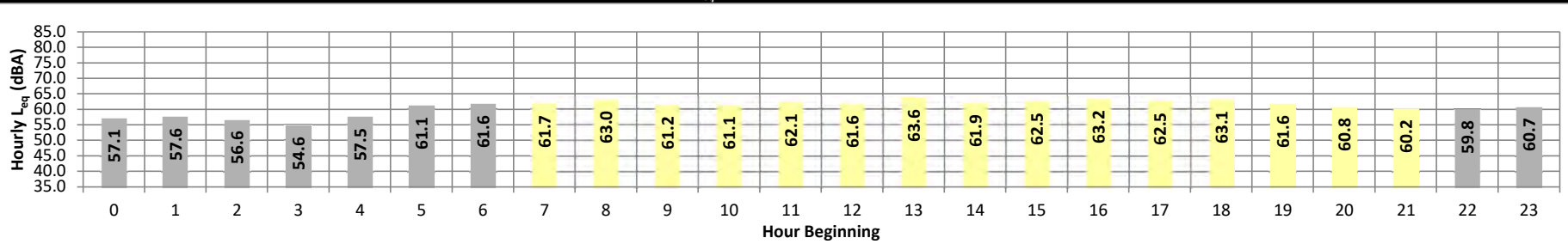
L_{eq} (dBA)		
24-Hour (CNEL)	Daytime (7am-10pm)	Nighttime (10pm-7am)
67.6	**64.9**	**59.4**

24-Hour Noise Level Measurement Summary

Date: Friday, June 10, 2022 | *Location:* L3 - Existing park land use located at 83700 Avenue 43, | *Meter:* Piccolo II | *JN:* 14744

Project: AVE 43 / Calhoun St. | *Source:* approximately 114 feet north of the Project site. | *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	57.1	65.2	53.8	64.8	64.1	61.6	60.0	56.6	55.7	54.4	54.1	53.9	57.1	10.0	67.1
	1	57.6	62.5	54.6	62.2	61.7	60.3	59.6	58.2	57.0	55.3	55.0	54.7	57.6	10.0	67.6
	2	56.6	67.9	50.6	67.5	66.4	62.5	59.4	54.7	53.3	51.5	51.1	50.7	56.6	10.0	66.6
	3	54.6	62.7	51.1	62.3	61.6	59.0	57.1	54.4	53.3	51.7	51.5	51.2	54.6	10.0	64.6
	4	57.5	67.6	53.1	67.1	66.2	63.1	60.7	56.2	55.0	53.7	53.5	53.2	57.5	10.0	67.5
	5	61.1	71.6	54.8	71.3	70.6	67.7	65.3	59.7	57.1	55.4	55.2	54.9	61.1	10.0	71.1
	6	61.6	70.7	55.3	70.4	69.7	67.8	66.5	61.1	57.8	55.9	55.7	55.4	61.6	10.0	71.6
Day	7	61.7	72.2	50.6	71.9	71.2	69.1	67.2	60.6	55.1	51.2	50.9	50.7	61.7	0.0	61.7
	8	63.0	73.0	54.1	72.6	71.9	69.7	67.9	62.6	58.5	55.1	54.7	54.2	63.0	0.0	63.0
	9	61.2	71.4	51.7	71.1	70.4	67.9	66.3	60.8	55.9	52.5	52.2	51.8	61.2	0.0	61.2
	10	61.1	71.6	49.2	71.2	70.6	68.3	66.6	60.6	54.3	50.0	49.6	49.3	61.1	0.0	61.1
	11	62.1	72.7	49.7	72.4	71.5	68.8	67.1	61.8	55.8	50.6	50.2	49.8	62.1	0.0	62.1
	12	61.6	71.4	49.6	71.0	70.1	68.0	66.7	62.3	56.4	50.5	50.0	49.7	61.6	0.0	61.6
	13	63.6	73.9	51.0	73.5	72.8	70.8	69.0	63.2	58.1	52.1	51.6	51.1	63.6	0.0	63.6
	14	61.9	71.3	50.7	71.0	70.4	68.3	67.1	62.3	56.8	51.7	51.3	50.8	61.9	0.0	61.9
	15	62.5	72.6	50.0	72.2	71.4	68.9	67.2	63.0	57.7	51.3	50.6	50.1	62.5	0.0	62.5
	16	63.2	73.8	50.8	73.3	72.5	69.8	67.8	63.2	58.0	51.9	51.4	50.9	63.2	0.0	63.2
	17	62.5	72.3	52.4	71.9	71.2	68.7	67.0	62.9	58.4	53.5	53.0	52.6	62.5	0.0	62.5
	18	63.1	73.3	52.2	72.9	72.1	69.5	67.7	63.3	58.3	53.2	52.8	52.3	63.1	0.0	63.1
	19	61.6	70.8	53.1	70.3	69.5	67.6	66.3	62.3	57.9	54.0	53.6	53.2	61.6	5.0	66.6
	20	60.8	70.1	49.1	69.8	69.2	67.3	65.9	61.3	55.7	50.1	49.7	49.3	60.8	5.0	65.8
	21	60.2	70.2	48.9	69.9	69.2	66.9	65.2	60.3	55.0	49.7	49.3	49.0	60.2	5.0	65.2
Night	22	59.8	71.3	50.6	70.7	69.9	67.0	64.5	58.1	53.5	51.1	50.9	50.7	59.8	10.0	69.8
	23	60.7	73.6	49.3	73.1	72.0	68.6	64.5	56.8	52.4	49.9	49.7	49.4	60.7	10.0	70.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	60.2	70.1	48.9	69.8	69.2	66.9	65.2	60.3	54.3	49.7	49.3	49.0
	Max	63.6	73.9	54.1	73.5	72.8	70.8	69.0	63.3	58.5	55.1	54.7	54.2
Energy Average		62.1	Average:		71.7	70.9	68.6	67.0	62.0	56.8	51.8	51.4	51.0
Night	Min	54.6	62.5	49.3	62.2	61.6	59.0	57.1	54.4	52.4	49.9	49.7	49.4
	Max	61.6	73.6	55.3	73.1	72.0	68.6	66.5	61.1	57.8	55.9	55.7	55.4
Energy Average		59.1	Average:		67.7	66.9	64.2	62.0	57.3	55.0	53.2	53.0	52.7

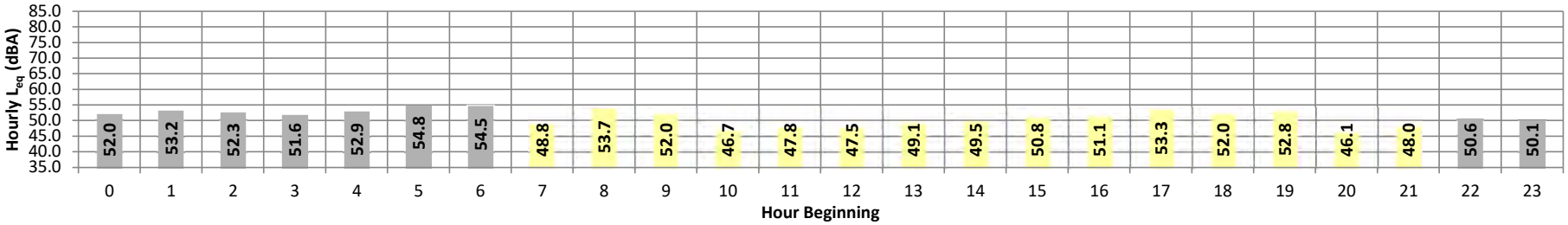
L_{eq} (dBA)		
24-Hour (CNEL)	Daytime (7am-10pm)	Nighttime (10pm-7am)
66.4	**62.1**	**59.1**

24-Hour Noise Level Measurement Summary

Date: Friday, June 10, 2022 | *Location:* L4 - Existing residence located at 43309 Avenida Estrella, | *Meter:* Piccolo II | *JN:* 14744

Project: AVE 43 / Calhoun St. | *Source:* approximately 12 feet east of the Project site. | *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	52.0	54.5	49.6	54.3	54.1	53.7	53.4	52.6	51.8	50.4	50.1	49.7	52.0	10.0	62.0
	1	53.2	56.4	50.2	56.1	55.9	55.3	55.0	54.0	52.9	51.0	50.7	50.3	53.2	10.0	63.2
	2	52.3	55.6	49.2	55.4	55.1	54.6	54.3	53.1	52.1	50.1	49.7	49.3	52.3	10.0	62.3
	3	51.6	56.7	48.9	56.2	55.7	54.3	53.6	52.0	51.1	49.7	49.4	49.1	51.6	10.0	61.6
	4	52.9	57.4	50.2	57.2	56.9	55.8	54.7	53.3	52.4	50.9	50.6	50.3	52.9	10.0	62.9
	5	54.8	57.5	52.4	57.3	57.1	56.7	56.4	55.5	54.6	53.2	52.9	52.6	54.8	10.0	64.8
	6	54.5	60.4	52.2	59.4	58.5	56.9	56.3	54.7	54.0	52.9	52.6	52.3	54.5	10.0	64.5
Day	7	48.8	55.1	45.6	54.8	54.5	53.3	52.4	48.5	47.2	46.2	45.9	45.7	48.8	0.0	48.8
	8	53.7	57.7	50.9	57.4	57.0	56.1	55.6	54.2	53.3	51.7	51.4	51.0	53.7	0.0	53.7
	9	52.0	58.0	47.6	57.8	57.6	56.8	56.1	52.1	50.2	48.5	48.2	47.8	52.0	0.0	52.0
	10	46.7	52.9	43.7	52.6	52.2	50.7	49.8	46.5	45.5	44.3	44.1	43.8	46.7	0.0	46.7
	11	47.8	54.6	44.6	54.3	53.8	52.3	51.1	47.6	46.4	45.2	45.0	44.7	47.8	0.0	47.8
	12	47.5	53.1	44.4	52.8	52.5	51.2	50.5	47.9	46.4	45.0	44.8	44.5	47.5	0.0	47.5
	13	49.1	56.2	45.8	55.8	55.5	53.5	51.8	48.9	47.8	46.4	46.2	45.9	49.1	0.0	49.1
	14	49.5	55.7	46.3	55.3	55.0	53.7	52.6	49.5	48.3	47.0	46.7	46.4	49.5	0.0	49.5
	15	50.8	60.4	45.6	60.0	59.3	57.5	55.9	49.0	47.5	46.2	46.0	45.7	50.8	0.0	50.8
	16	51.1	59.1	46.7	58.8	58.2	56.3	55.1	50.9	48.9	47.4	47.1	46.8	51.1	0.0	51.1
	17	53.3	61.2	48.5	61.0	60.7	59.3	57.5	52.8	51.1	49.3	49.0	48.6	53.3	0.0	53.3
	18	52.0	57.5	48.8	57.1	56.7	55.4	54.7	52.4	51.1	49.6	49.3	48.9	52.0	0.0	52.0
	19	52.8	59.9	49.8	59.1	58.3	57.2	55.5	52.5	51.7	50.5	50.2	49.9	52.8	5.0	57.8
	20	46.1	54.1	42.5	53.4	52.5	50.3	49.2	46.1	44.4	43.1	42.9	42.6	46.1	5.0	51.1
	21	48.0	52.6	45.5	52.1	51.7	50.7	50.2	48.4	47.5	46.2	45.9	45.6	48.0	5.0	53.0
Night	22	50.6	61.3	47.6	59.7	57.7	53.4	51.6	50.2	49.4	48.3	48.1	47.8	50.6	10.0	60.6
	23	50.1	60.6	46.8	58.9	57.0	52.8	51.2	49.8	49.0	47.6	47.3	47.0	50.1	10.0	60.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	46.1	52.6	42.5	52.1	51.7	50.3	49.2	46.1	44.4	43.1	42.9	42.6
	Max	53.7	61.2	50.9	61.0	60.7	59.3	57.5	54.2	53.3	51.7	51.4	51.0
Energy Average		50.6	Average:		56.2	55.7	54.3	53.2	49.8	48.5	47.1	46.8	46.5
Night	Min	50.1	54.5	46.8	54.3	54.1	52.8	51.2	49.8	49.0	47.6	47.3	47.0
	Max	54.8	61.3	52.4	59.7	58.5	56.9	56.4	55.5	54.6	53.2	52.9	52.6
Energy Average		52.7	Average:		57.2	56.4	54.8	54.1	52.8	51.9	50.5	50.2	49.8

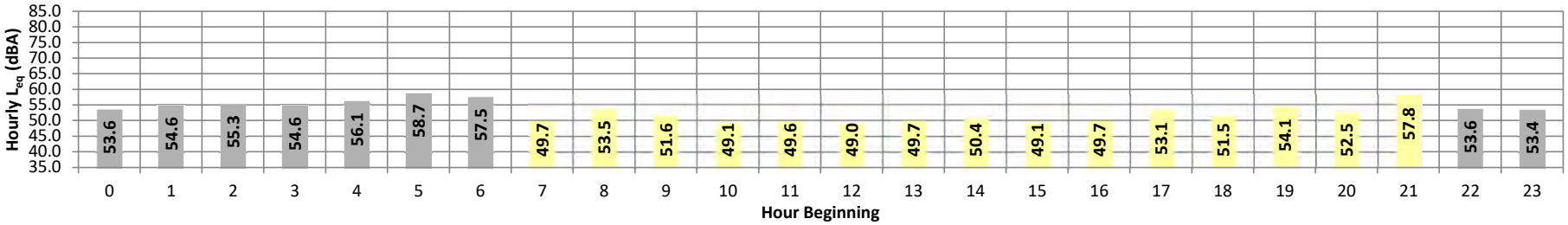
L_{eq} (dBA)		
24-Hour (CNEL)	Daytime (7am-10pm)	Nighttime (10pm-7am)
59.0	**50.6**	**52.7**

24-Hour Noise Level Measurement Summary

Date: Friday, June 10, 2022 | *Location:* L5 - Existing residence located at 43347 Commanche Street, | *Meter:* Piccolo II | *JN:* 14744

Project: AVE 43 / Calhoun St. | *Source:* approximately 16 feet south of the Project site. | *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	53.6	56.2	50.9	56.0	55.8	55.5	55.2	54.2	53.4	51.8	51.5	51.1	53.6	10.0	63.6
	1	54.6	58.2	51.2	57.9	57.6	57.1	56.7	55.4	54.3	52.2	51.8	51.3	54.6	10.0	64.6
	2	55.3	59.0	52.0	58.4	58.0	57.4	57.1	56.1	55.0	53.1	52.7	52.2	55.3	10.0	65.3
	3	54.6	57.5	51.8	57.2	57.0	56.5	56.2	55.3	54.4	52.7	52.4	51.9	54.6	10.0	64.6
	4	56.1	58.8	53.5	58.5	58.3	57.8	57.6	56.7	55.9	54.4	54.1	53.7	56.1	10.0	66.1
	5	58.7	62.0	56.3	61.6	61.1	60.4	60.2	59.3	58.5	57.1	56.8	56.5	58.7	10.0	68.7
	6	57.5	59.5	55.5	59.4	59.2	58.8	58.6	58.0	57.3	56.1	55.9	55.6	57.5	10.0	67.5
Day	7	49.7	53.5	47.7	52.9	52.4	51.7	51.3	50.1	49.4	48.3	48.0	47.8	49.7	0.0	49.7
	8	53.5	57.1	50.3	56.8	56.5	55.8	55.4	54.2	53.1	51.2	50.9	50.4	53.5	0.0	53.5
	9	51.6	55.8	48.1	55.3	54.9	54.2	53.6	52.3	51.1	49.3	48.9	48.3	51.6	0.0	51.6
	10	49.1	55.2	45.7	54.8	54.1	52.9	51.4	49.6	48.3	46.5	46.2	45.8	49.1	0.0	49.1
	11	49.6	54.8	46.4	54.3	53.8	52.6	51.9	50.2	48.9	47.2	46.9	46.5	49.6	0.0	49.6
	12	49.0	52.3	46.2	52.0	51.7	51.2	50.8	49.6	48.7	47.1	46.7	46.4	49.0	0.0	49.0
	13	49.7	53.7	47.0	53.3	52.8	52.1	51.7	50.3	49.3	47.8	47.4	47.1	49.7	0.0	49.7
	14	50.4	54.0	47.6	53.6	53.2	52.6	52.2	51.0	50.1	48.5	48.1	47.7	50.4	0.0	50.4
	15	49.1	52.7	46.4	52.3	52.0	51.4	50.8	49.7	48.8	47.2	46.9	46.5	49.1	0.0	49.1
	16	49.7	53.4	46.6	53.1	52.8	52.0	51.6	50.3	49.3	47.6	47.2	46.7	49.7	0.0	49.7
	17	53.1	59.2	49.0	58.5	57.7	56.4	55.9	54.0	52.1	49.9	49.6	49.2	53.1	0.0	53.1
	18	51.5	55.8	48.1	55.4	54.9	54.0	53.6	52.2	51.1	49.1	48.7	48.2	51.5	0.0	51.5
	19	54.1	62.7	49.1	61.7	60.6	58.3	57.2	54.3	52.8	50.2	49.7	49.3	54.1	5.0	59.1
	20	52.5	64.9	46.3	62.9	61.0	56.7	54.7	52.2	50.1	47.1	46.8	46.4	52.5	5.0	57.5
	21	57.8	63.9	52.0	63.3	62.7	61.5	60.7	58.7	57.1	53.8	53.2	52.2	57.8	5.0	62.8
Night	22	53.6	60.7	50.6	59.6	58.7	56.9	55.6	53.8	52.8	51.4	51.1	50.7	53.6	10.0	63.6
	23	53.4	59.4	50.6	58.4	57.4	55.7	55.1	53.8	52.9	51.4	51.1	50.7	53.4	10.0	63.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	49.0	52.3	45.7	52.0	51.7	51.2	50.8	49.6	48.3	46.5	46.2	45.8
	Max	57.8	64.9	52.0	63.3	62.7	61.5	60.7	58.7	57.1	53.8	53.2	52.2
Energy Average		52.2	Average:		56.0	55.4	54.2	53.5	51.9	50.7	48.7	48.3	47.9
Night	Min	53.4	56.2	50.6	56.0	55.8	55.5	55.1	53.8	52.8	51.4	51.1	50.7
	Max	58.7	62.0	56.3	61.6	61.1	60.4	60.2	59.3	58.5	57.1	56.8	56.5
Energy Average		55.6	Average:		58.5	58.1	57.3	56.9	55.8	54.9	53.4	53.0	52.6

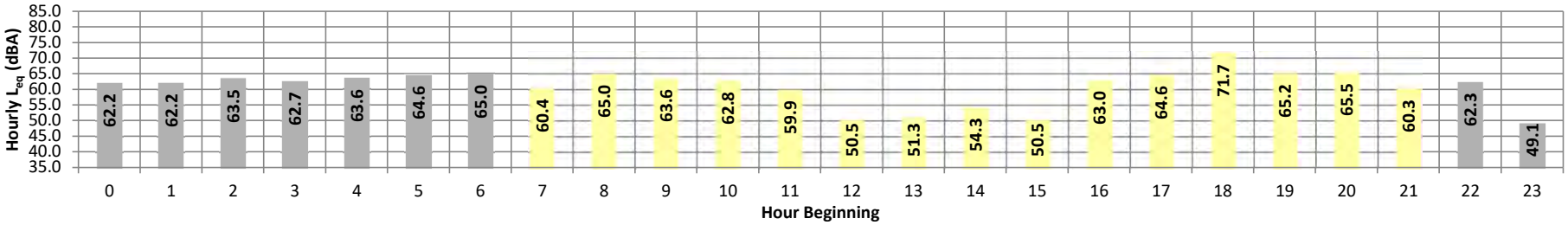
L_{eq} (dBA)		
24-Hour (CNEL)	Daytime (7am-10pm)	Nighttime (10pm-7am)
62.0	**52.2**	**55.6**

24-Hour Noise Level Measurement Summary

Date: Friday, June 10, 2022 | *Location:* L6 - Existing residence located at 83509 Hopi Avenue, | *Meter:* Piccolo II | *JN:* 14744

Project: AVE 43 / Calhoun St. | *Source:* approximately 16 feet east of the Project site | *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*	*L_{eq}*	*Adj.*	*Adj. L_{eq}*
Night	0	62.2	65.5	57.6	65.3	65.1	64.7	64.4	63.2	61.9	59.0	58.5	57.8	62.2	10.0	72.2
	1	62.2	66.3	56.9	66.1	65.8	65.3	64.8	63.5	61.7	58.4	57.7	57.1	62.2	10.0	72.2
	2	63.5	67.2	58.4	67.0	66.8	66.2	65.9	64.6	63.1	59.8	59.2	58.6	63.5	10.0	73.5
	3	62.7	66.5	57.6	66.2	66.0	65.5	65.2	63.9	62.3	59.1	58.5	57.8	62.7	10.0	72.7
	4	63.6	66.9	59.3	66.6	66.4	66.0	65.8	64.6	63.2	60.6	60.0	59.4	63.6	10.0	73.6
	5	64.6	67.4	61.5	67.2	67.0	66.6	66.3	65.4	64.4	62.5	62.1	61.7	64.6	10.0	74.6
	6	65.0	67.5	61.9	67.4	67.2	66.8	66.6	65.8	64.8	62.9	62.5	62.0	65.0	10.0	75.0
Day	7	60.4	64.0	57.0	63.7	63.4	62.7	62.3	61.2	60.1	58.0	57.6	57.1	60.4	0.0	60.4
	8	65.0	69.1	61.6	68.7	68.3	67.5	67.1	65.7	64.6	62.7	62.2	61.7	65.0	0.0	65.0
	9	63.6	68.5	59.9	68.0	67.3	66.2	65.8	64.4	63.2	61.1	60.6	60.1	63.6	0.0	63.6
	10	62.8	72.1	53.7	70.7	69.6	67.0	66.2	63.3	61.4	56.8	55.4	54.0	62.8	0.0	62.8
	11	59.9	68.9	47.3	68.2	67.8	66.5	64.2	61.2	56.2	48.6	48.0	47.5	59.9	0.0	59.9
	12	50.5	58.4	46.1	57.8	57.3	54.7	52.9	50.6	49.2	47.1	46.7	46.2	50.5	0.0	50.5
	13	51.3	54.1	48.9	53.8	53.6	53.1	52.9	52.0	51.1	49.6	49.3	49.0	51.3	0.0	51.3
	14	54.3	68.7	46.3	66.6	64.3	60.3	56.9	51.3	49.9	47.3	46.9	46.4	54.3	0.0	54.3
	15	50.5	55.3	46.2	55.0	54.7	53.7	53.0	51.3	49.8	47.4	46.9	46.4	50.5	0.0	50.5
	16	63.0	69.1	53.7	68.5	67.8	66.8	66.3	65.2	61.6	55.1	54.3	53.9	63.0	0.0	63.0
	17	64.6	71.3	51.5	71.0	70.4	69.4	68.9	66.8	61.7	52.4	52.2	51.7	64.6	0.0	64.6
	18	71.7	82.5	56.5	81.2	80.0	77.5	76.3	72.2	67.6	61.1	59.7	57.4	71.7	0.0	71.7
	19	65.2	76.5	53.3	75.2	73.7	71.1	69.5	65.2	61.3	56.5	55.5	54.0	65.2	5.0	70.2
	20	65.5	80.9	51.3	79.0	76.8	71.6	67.7	62.0	58.4	53.4	52.6	51.7	65.5	5.0	70.5
	21	60.3	75.0	51.1	72.9	70.7	64.9	61.8	58.4	56.0	52.6	52.1	51.4	60.3	5.0	65.3
Night	22	62.3	74.3	53.1	73.0	71.8	68.1	65.6	61.4	58.6	55.7	55.1	53.8	62.3	10.0	72.3
	23	49.1	54.6	47.6	53.6	52.5	50.9	50.4	49.3	48.8	48.1	47.9	47.7	49.1	10.0	59.1

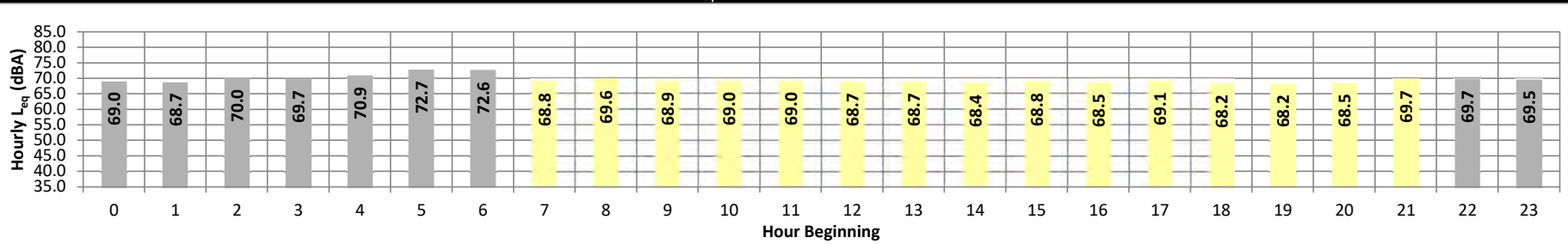
Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*	*L_{eq} (dBA)*		
Day	Min	50.5	54.1	46.1	53.8	53.6	53.1	52.9	50.6	49.2	47.1	46.7	46.2	*24-Hour (CNEL)*	*Daytime (7am-10pm)*	*Nighttime (10pm-7am)*
	Max	71.7	82.5	61.6	81.2	80.0	77.5	76.3	72.2	67.6	62.7	62.2	61.7			
Energy Average		64.0	Average:		68.0	67.0	64.9	63.5	60.7	58.2	54.0	53.3	52.6			
Night	Min	49.1	54.6	47.6	53.6	52.5	50.9	50.4	49.3	48.8	48.1	47.9	47.7	**69.8**	**64.0**	**62.9**
	Max	65.0	74.3	61.9	73.0	71.8	68.1	66.6	65.8	64.8	62.9	62.5	62.0			
Energy Average		62.9	Average:		65.8	65.4	64.5	63.9	62.4	61.0	58.5	57.9	57.3			

24-Hour Noise Level Measurement Summary

Date: Friday, June 10, 2022 | *Location:* L7 - Located near an existing residence at 43561 Pueblo Street | *Meter:* Piccolo II | *JN:* 14744

Project: AVE 43 / Calhoun St. | *Source:* | *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	69.0	72.4	64.4	72.2	72.0	71.6	71.2	70.0	68.6	65.8	65.2	64.6	69.0	10.0	79.0
	1	68.7	73.0	62.9	72.8	72.5	72.0	71.7	70.0	68.1	64.5	63.8	63.1	68.7	10.0	78.7
	2	70.0	73.8	64.6	73.6	73.4	73.0	72.6	71.2	69.6	66.3	65.6	64.8	70.0	10.0	80.0
	3	69.7	73.6	64.7	73.3	73.1	72.6	72.3	70.9	69.3	66.1	65.5	64.9	69.7	10.0	79.7
	4	70.9	74.3	66.5	74.1	73.9	73.4	73.1	72.0	70.5	67.8	67.3	66.7	70.9	10.0	80.9
	5	72.7	75.6	69.4	75.4	75.2	74.8	74.5	73.6	72.5	70.5	70.0	69.5	72.7	10.0	82.7
	6	72.6	75.3	69.3	75.1	74.9	74.6	74.4	73.4	72.3	70.5	70.0	69.5	72.6	10.0	82.6
Day	7	68.8	72.1	65.0	71.9	71.7	71.3	71.0	69.8	68.5	66.2	65.7	65.1	68.8	0.0	68.8
	8	69.6	73.8	65.1	73.4	73.1	72.3	71.9	70.5	69.2	66.6	66.0	65.3	69.6	0.0	69.6
	9	68.9	72.9	64.4	72.6	72.4	71.7	71.3	70.0	68.5	65.7	65.2	64.6	68.9	0.0	68.9
	10	69.0	73.1	64.4	72.9	72.6	71.8	71.4	70.0	68.6	65.8	65.2	64.5	69.0	0.0	69.0
	11	69.0	72.9	64.4	72.7	72.4	71.8	71.4	70.1	68.6	65.9	65.2	64.6	69.0	0.0	69.0
	12	68.7	72.9	63.8	72.6	72.3	71.6	71.2	69.8	68.2	65.4	64.8	64.0	68.7	0.0	68.7
	13	68.7	72.9	64.2	72.5	72.2	71.5	71.1	69.7	68.3	65.5	65.0	64.4	68.7	0.0	68.7
	14	68.4	72.4	63.9	72.1	71.7	71.1	70.6	69.3	68.0	65.2	64.6	64.1	68.4	0.0	68.4
	15	68.8	73.0	64.5	72.7	72.4	71.6	71.2	69.8	68.3	65.8	65.3	64.7	68.8	0.0	68.8
	16	68.5	72.5	63.9	72.2	72.0	71.4	70.9	69.5	68.0	65.2	64.7	64.0	68.5	0.0	68.5
	17	69.1	73.0	64.7	72.7	72.4	71.7	71.2	70.0	68.7	66.2	65.6	64.9	69.1	0.0	69.1
	18	68.2	71.8	64.0	71.6	71.3	70.8	70.4	69.1	67.8	65.2	64.7	64.1	68.2	0.0	68.2
	19	68.2	71.5	64.4	71.3	71.1	70.7	70.4	69.2	67.9	65.6	65.1	64.6	68.2	5.0	73.2
	20	68.5	71.5	64.9	71.3	71.1	70.7	70.4	69.5	68.3	66.0	65.5	65.0	68.5	5.0	73.5
	21	69.7	74.0	66.1	73.6	73.2	72.4	71.7	70.5	69.2	67.2	66.7	66.2	69.7	5.0	74.7
Night	22	69.7	73.1	65.7	72.9	72.6	72.2	71.8	70.6	69.4	67.0	66.5	65.8	69.7	10.0	79.7
	23	69.5	73.4	65.0	73.1	72.8	72.2	71.8	70.5	69.1	66.5	65.9	65.2	69.5	10.0	79.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	68.2	71.5	63.8	71.3	71.1	70.7	70.4	69.1	67.8	65.2	64.6	64.0
	Max	69.7	74.0	66.1	73.6	73.2	72.4	71.9	70.5	69.2	67.2	66.7	66.2
Energy Average		68.8	Average:		72.4	72.1	71.5	71.1	69.8	68.4	65.8	65.3	64.7
Night	Min	68.7	72.4	62.9	72.2	72.0	71.6	71.2	70.0	68.1	64.5	63.8	63.1
	Max	72.7	75.6	69.4	75.4	75.2	74.8	74.5	73.6	72.5	70.5	70.0	69.5
Energy Average		70.5	Average:		73.6	73.4	72.9	72.6	71.3	69.9	67.2	66.7	66.0

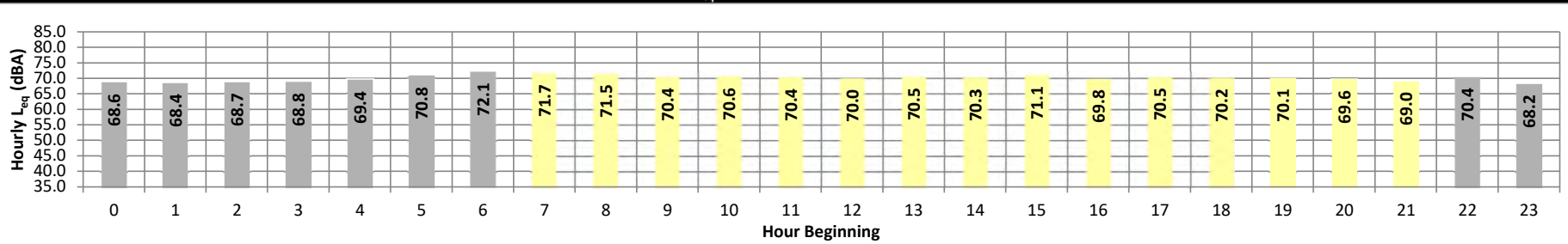
L_{eq} (dBA)		
24-Hour (CNEL)	Daytime (7am-10pm)	Nighttime (10pm-7am)
76.9	**68.8**	**70.5**

24-Hour Noise Level Measurement Summary

Date: Friday, June 10, 2022 *Location:* L8 - Located near an existing residence located at 42969 Hopi *Meter:* Piccolo II *JN:* 14744

Project: AVE 43 / Calhoun St. *Source:* Avenue *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	68.6	75.5	61.3	75.2	74.8	73.4	72.4	69.6	67.0	62.8	62.0	61.4	68.6	10.0	78.6
	1	68.4	75.1	61.2	74.8	74.5	73.3	72.4	69.4	66.6	62.6	61.9	61.4	68.4	10.0	78.4
	2	68.7	75.6	59.8	75.3	74.8	73.6	72.8	70.0	66.8	61.8	60.8	60.1	68.7	10.0	78.7
	3	68.8	75.4	60.4	75.1	74.7	73.6	72.9	70.0	67.0	62.2	61.4	60.6	68.8	10.0	78.8
	4	69.4	75.5	62.5	75.1	74.8	73.7	73.1	70.5	68.0	64.3	63.4	62.7	69.4	10.0	79.4
	5	70.8	77.2	64.2	76.9	76.5	74.9	74.1	71.8	69.7	65.8	65.0	64.3	70.8	10.0	80.8
	6	72.1	78.2	65.7	77.9	77.6	76.2	75.0	73.1	70.9	67.4	66.6	65.9	72.1	10.0	82.1
Day	7	71.7	81.6	64.7	81.0	79.9	76.2	74.5	71.8	69.7	66.2	65.5	64.8	71.7	0.0	71.7
	8	71.5	77.5	65.6	77.1	76.6	75.4	74.7	72.5	70.5	67.2	66.5	65.8	71.5	0.0	71.5
	9	70.4	76.7	64.2	76.2	75.5	74.1	73.6	71.6	69.4	65.8	65.1	64.3	70.4	0.0	70.4
	10	70.6	77.2	64.3	76.7	76.2	74.6	73.8	71.5	69.6	65.9	65.3	64.5	70.6	0.0	70.6
	11	70.4	75.7	64.6	75.3	75.0	73.9	73.3	71.5	69.5	66.3	65.5	64.7	70.4	0.0	70.4
	12	70.0	75.8	64.0	75.6	75.2	74.0	73.2	71.1	69.0	65.7	64.9	64.2	70.0	0.0	70.0
	13	70.5	77.8	64.2	77.2	76.6	74.8	73.6	71.2	69.2	65.7	65.0	64.3	70.5	0.0	70.5
	14	70.3	76.3	64.7	75.9	75.3	73.9	73.3	71.2	69.3	66.3	65.6	64.8	70.3	0.0	70.3
	15	71.1	79.3	65.4	78.8	77.7	75.2	73.9	71.5	69.7	66.8	66.2	65.6	71.1	0.0	71.1
	16	69.8	75.0	64.2	74.7	74.4	73.6	73.0	70.9	68.9	65.8	65.1	64.3	69.8	0.0	69.8
	17	70.5	76.8	64.8	76.4	75.8	74.5	73.7	71.4	69.3	66.3	65.6	65.0	70.5	0.0	70.5
	18	70.2	75.6	64.7	75.2	74.8	73.8	73.2	71.2	69.3	66.2	65.6	64.9	70.2	0.0	70.2
	19	70.1	75.6	65.0	75.3	74.9	74.0	73.2	71.1	69.1	66.2	65.7	65.1	70.1	5.0	75.1
	20	69.6	77.8	62.7	77.1	76.2	73.9	72.8	70.3	68.1	64.5	63.6	62.8	69.6	5.0	74.6
	21	69.0	75.4	62.6	75.1	74.7	73.3	72.4	70.0	67.5	64.1	63.4	62.7	69.0	5.0	74.0
Night	22	70.4	81.2	62.9	80.7	79.6	75.5	73.1	70.0	67.6	64.4	63.8	63.0	70.4	10.0	80.4
	23	68.2	74.5	61.2	74.2	73.8	72.5	71.5	69.2	66.9	63.3	62.4	61.4	68.2	10.0	78.2

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	69.0	75.0	62.6	74.7	74.4	73.3	72.4	70.0	67.5	64.1	63.4	62.7
	Max	71.7	81.6	65.6	81.0	79.9	76.2	74.7	72.5	70.5	67.2	66.5	65.8
Energy Average		70.4	Average:		76.5	75.9	74.4	73.5	71.2	69.2	65.9	65.2	64.5
Night	Min	68.2	74.5	59.8	74.2	73.8	72.5	71.5	69.2	66.6	61.8	60.8	60.1
	Max	72.1	81.2	65.7	80.7	79.6	76.2	75.0	73.1	70.9	67.4	66.6	65.9
Energy Average		69.7	Average:		76.1	75.7	74.1	73.0	70.4	67.8	63.8	63.0	62.3

L_{eq} (dBA)		
24-Hour (CNEL)	Daytime (7am-10pm)	Nighttime (10pm-7am)
76.5	**70.4**	**69.7**

APPENDIX 7.1:

ON-SITE TRAFFIC NOISE LEVEL CALCULATIONS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Avenue 43
Lot No: Phase 1 s/o Ave 43

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	35.972
Medium Trucks:	35.725
Heavy Trucks:	35.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	2.04	-1.20	*-0.83*	0.000	0.000
Medium Trucks:	77.62	-20.50	2.09	-1.20	*-1.15*	0.000	0.000
Heavy Trucks:	82.14	-24.45	2.08	-1.20	*-2.17*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.9	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	58.0	56.5	50.1	48.6	57.1	57.3
Heavy Trucks:	58.6	57.1	48.1	49.4	57.7	57.8
Vehicle Noise:	68.0	66.2	63.6	58.4	66.9	67.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.9	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	58.0	56.5	50.1	48.6	57.1	57.3
Heavy Trucks:	58.6	57.1	48.1	49.4	57.7	57.8
Vehicle Noise:	68.0	66.2	63.6	58.4	66.9	67.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Calhoun Street
Lot No: Phase 1 e/o Calhoun St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	35.972
Medium Trucks:	35.725
Heavy Trucks:	35.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	2.04	-1.20	*-0.83*	0.000	0.000
Medium Trucks:	74.83	-23.18	2.09	-1.20	*-1.15*	0.000	0.000
Heavy Trucks:	80.05	-27.14	2.08	-1.20	*-2.17*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: I-10
Lot No: Phase 2 Edge of Project Site to I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	45.000
Medium Trucks:	44.803
Heavy Trucks:	44.822

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	0.58	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.53	-7.09	0.61	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.83	-2.96	0.61	-1.20	*-5.34*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	80.2	78.3	76.5	70.8	79.3	79.8
Medium Trucks:	74.9	73.3	67.0	65.4	73.9	74.1
Heavy Trucks:	82.3	80.9	71.8	73.1	81.4	81.5
Vehicle Noise:	84.8	83.2	78.1	75.5	83.9	84.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	80.2	78.3	76.5	70.8	79.3	79.8
Medium Trucks:	74.9	73.3	67.0	65.4	73.9	74.1
Heavy Trucks:	82.3	80.9	71.8	73.1	81.4	81.5
Vehicle Noise:	84.8	83.2	78.1	75.5	83.9	84.2

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: I-10
Lot No: Phase 2 35' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	135.0 feet
Barrier Distance to Observer:	35.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	86.313
Medium Trucks:	86.211
Heavy Trucks:	86.221

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-3.66	-1.20	*-0.22*	0.000	0.000
Medium Trucks:	82.53	-7.09	-3.65	-1.20	*-0.35*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-3.65	-1.20	*-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:	75.9	74.0	72.2	66.6	75.0	75.6
Medium Trucks:	70.6	69.1	62.7	61.2	69.6	69.9
Heavy Trucks:	78.0	76.6	67.6	68.8	77.2	77.3
Vehicle Noise:	80.6	79.0	73.9	71.3	79.7	80.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.9	74.0	72.2	66.6	75.0	75.6
Medium Trucks:	70.6	69.1	62.7	61.2	69.6	69.9
Heavy Trucks:	78.0	76.6	67.6	68.8	77.2	77.3
Vehicle Noise:	80.6	79.0	73.9	71.3	79.7	80.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: I-10
Lot No: Phase 2 130' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	230.0 feet
Barrier Distance to Observer:	130.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	185.809
Medium Trucks:	185.761
Heavy Trucks:	185.766

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-8.65	-1.20	*-0.03*	0.000	0.000
Medium Trucks:	82.53	-7.09	-8.65	-1.20	*-0.12*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-8.65	-1.20	*-0.59*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.6	70.0	70.6
Medium Trucks:	65.6	64.1	57.7	56.2	64.6	64.9
Heavy Trucks:	73.0	71.6	62.6	63.8	72.2	72.3
Vehicle Noise:	75.6	74.0	68.9	66.3	74.7	75.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.6	70.0	70.6
Medium Trucks:	65.6	64.1	57.7	56.2	64.6	64.9
Heavy Trucks:	73.0	71.6	62.6	63.8	72.2	72.3
Vehicle Noise:	75.6	74.0	68.9	66.3	74.7	75.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: I-10
Lot No: Phase 2 200' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	300.0 feet
Barrier Distance to Observer:	200.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	256.953
Medium Trucks:	256.919
Heavy Trucks:	256.922

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-10.77	-1.20	*-0.01*	0.000	0.000
Medium Trucks:	82.53	-7.09	-10.77	-1.20	*-0.09*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-10.77	-1.20	*-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:	68.8	66.9	65.1	59.5	67.9	68.5
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.8
Heavy Trucks:	70.9	69.5	60.4	61.7	70.0	70.2
Vehicle Noise:	73.4	71.9	66.8	64.2	72.6	72.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.8	66.9	65.1	59.5	67.9	68.5
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.8
Heavy Trucks:	70.9	69.5	60.4	61.7	70.0	70.2
Vehicle Noise:	73.4	71.9	66.8	64.2	72.6	72.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: I-10
Lot No: Phase 2 325' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	425.0 feet
Barrier Distance to Observer:	325.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	382.949
Medium Trucks:	382.926
Heavy Trucks:	382.928

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-13.37	-1.20	*-0.01*	0.000	0.000
Medium Trucks:	82.53	-7.09	-13.37	-1.20	*-0.07*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-13.37	-1.20	*-0.55*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.9	65.3	65.9
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.2
Heavy Trucks:	68.3	66.9	57.8	59.1	67.4	67.6
Vehicle Noise:	70.8	69.3	64.2	61.6	70.0	70.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.9	65.3	65.9
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.2
Heavy Trucks:	68.3	66.9	57.8	59.1	67.4	67.6
Vehicle Noise:	70.8	69.3	64.2	61.6	70.0	70.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: I-10
Lot No: Phase 2 800' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	900.0 feet
Barrier Distance to Observer:	800.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	859.084
Medium Trucks:	859.074
Heavy Trucks:	859.075

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-18.63	-1.20	*0.00*	0.000	0.000
Medium Trucks:	82.53	-7.09	-18.63	-1.20	*-0.05*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-18.63	-1.20	*-0.53*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.9	59.0	57.3	51.6	60.0	60.6
Medium Trucks:	55.6	54.1	47.7	46.2	54.7	54.9
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	65.6	64.0	58.9	56.3	64.7	65.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.9	59.0	57.3	51.6	60.0	60.6
Medium Trucks:	55.6	54.1	47.7	46.2	54.7	54.9
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	65.6	64.0	58.9	56.3	64.7	65.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Avenue 43
Lot No: Phase 2 s/o Ave 43

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	35.972
Medium Trucks:	35.725
Heavy Trucks:	35.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	2.04	-1.20	*-0.83*	0.000	0.000
Medium Trucks:	77.62	-20.50	2.09	-1.20	*-1.15*	0.000	0.000
Heavy Trucks:	82.14	-24.45	2.08	-1.20	*-2.17*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.9	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	58.0	56.5	50.1	48.6	57.1	57.3
Heavy Trucks:	58.6	57.1	48.1	49.4	57.7	57.8
Vehicle Noise:	68.0	66.2	63.6	58.4	66.9	67.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.9	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	58.0	56.5	50.1	48.6	57.1	57.3
Heavy Trucks:	58.6	57.1	48.1	49.4	57.7	57.8
Vehicle Noise:	68.0	66.2	63.6	58.4	66.9	67.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Calhoun Street
Lot No: Phase 2 w/o Calhoun St n/o Hopi St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	35.972
Medium Trucks:	35.725
Heavy Trucks:	35.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	2.04	-1.20	*-0.83*	0.000	0.000
Medium Trucks:	74.83	-23.18	2.09	-1.20	*-1.15*	0.000	0.000
Heavy Trucks:	80.05	-27.14	2.08	-1.20	*-2.17*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Calhoun Street
Lot No: Phase 2 w/o Calhoun St s/o Hopi St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	35.972
Medium Trucks:	35.725
Heavy Trucks:	35.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	2.04	-1.20	*-0.83*	0.000	0.000
Medium Trucks:	74.83	-23.18	2.09	-1.20	*-1.15*	0.000	0.000
Heavy Trucks:	80.05	-27.14	2.08	-1.20	*-2.17*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Avenue 43
Lot No: Phase 1 Main Swimming Pool

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	360.0 feet
Barrier Distance to Observer:	323.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	349.893
Medium Trucks:	349.868
Heavy Trucks:	349.870

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	-12.78	-1.20	*0.00*	0.000	0.000
Medium Trucks:	77.62	-20.50	-12.78	-1.20	*-0.12*	0.000	0.000
Heavy Trucks:	82.14	-24.45	-12.78	-1.20	*-1.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.1	50.2	48.4	42.4	51.0	51.6
Medium Trucks:	43.1	41.6	35.3	33.7	42.2	42.4
Heavy Trucks:	43.7	42.3	33.3	34.5	42.9	43.0
Vehicle Noise:	53.2	51.4	48.8	43.5	52.1	52.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.1	50.2	48.4	42.4	51.0	51.6
Medium Trucks:	43.1	41.6	35.3	33.7	42.2	42.4
Heavy Trucks:	43.7	42.3	33.3	34.5	42.9	43.0
Vehicle Noise:	53.2	51.4	48.8	43.5	52.1	52.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Calhoun Street
Lot No: Phase 1 west Swimming Pool

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	260.0 feet
Barrier Distance to Observer:	223.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	249.850
Medium Trucks:	249.815
Heavy Trucks:	249.818

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	-10.58	-1.20	*-0.01*	0.000	0.000
Medium Trucks:	74.83	-23.18	-10.58	-1.20	*-0.14*	0.000	0.000
Heavy Trucks:	80.05	-27.14	-10.58	-1.20	*-1.17*	0.000	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	43.7	37.7	46.3	46.9
Medium Trucks:	39.9	38.4	32.0	30.4	38.9	39.1
Heavy Trucks:	41.1	39.7	30.7	31.9	40.3	40.4
Vehicle Noise:	48.9	47.1	44.2	39.3	47.8	48.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.4	45.5	43.7	37.7	46.3	46.9
Medium Trucks:	39.9	38.4	32.0	30.4	38.9	39.1
Heavy Trucks:	41.1	39.7	30.7	31.9	40.3	40.4
Vehicle Noise:	48.9	47.1	44.2	39.3	47.8	48.3

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Avenue 43
Lot No: Phase 1 s/o Ave 43

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	35.972
Medium Trucks:	35.725
Heavy Trucks:	35.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	2.04	-1.20	*-0.83*	0.000	0.000
Medium Trucks:	77.62	-20.50	2.09	-1.20	*-1.15*	0.000	0.000
Heavy Trucks:	82.14	-24.45	2.08	-1.20	*-2.17*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.9	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	58.0	56.5	50.1	48.6	57.1	57.3
Heavy Trucks:	58.6	57.1	48.1	49.4	57.7	57.8
Vehicle Noise:	68.0	66.2	63.6	58.4	66.9	67.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.9	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	58.0	56.5	50.1	48.6	57.1	57.3
Heavy Trucks:	58.6	57.1	48.1	49.4	57.7	57.8
Vehicle Noise:	68.0	66.2	63.6	58.4	66.9	67.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 1 e/o Calhoun St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	35.972
Medium Trucks:	35.725
Heavy Trucks:	35.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	2.04	-1.20	*-0.83*	0.000	0.000
Medium Trucks:	74.83	-23.18	2.09	-1.20	*-1.15*	0.000	0.000
Heavy Trucks:	80.05	-27.14	2.08	-1.20	*-2.17*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: I-10
Lot No: Phase 2 Edge of Project Site to I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	45.000
Medium Trucks:	44.803
Heavy Trucks:	44.822

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	0.58	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.53	-7.09	0.61	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.83	-2.96	0.61	-1.20	*-5.34*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	80.2	78.3	76.5	70.8	79.3	79.8
Medium Trucks:	74.9	73.3	67.0	65.4	73.9	74.1
Heavy Trucks:	82.3	80.9	71.8	73.1	81.4	81.5
Vehicle Noise:	84.8	83.2	78.1	75.5	83.9	84.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	80.2	78.3	76.5	70.8	79.3	79.8
Medium Trucks:	74.9	73.3	67.0	65.4	73.9	74.1
Heavy Trucks:	82.3	80.9	71.8	73.1	81.4	81.5
Vehicle Noise:	84.8	83.2	78.1	75.5	83.9	84.2

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: I-10
Lot No: Phase 2 35' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	135.0 feet
Barrier Distance to Observer:	35.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	86.313
Medium Trucks:	86.211
Heavy Trucks:	86.221

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-3.66	-1.20	*-0.22*	0.000	0.000
Medium Trucks:	82.53	-7.09	-3.65	-1.20	*-0.35*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-3.65	-1.20	*-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:	75.9	74.0	72.2	66.6	75.0	75.6
Medium Trucks:	70.6	69.1	62.7	61.2	69.6	69.9
Heavy Trucks:	78.0	76.6	67.6	68.8	77.2	77.3
Vehicle Noise:	80.6	79.0	73.9	71.3	79.7	80.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.9	74.0	72.2	66.6	75.0	75.6
Medium Trucks:	70.6	69.1	62.7	61.2	69.6	69.9
Heavy Trucks:	78.0	76.6	67.6	68.8	77.2	77.3
Vehicle Noise:	80.6	79.0	73.9	71.3	79.7	80.0

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: I-10
Lot No: Phase 2 130' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	230.0 feet
Barrier Distance to Observer:	130.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	185.809
Medium Trucks:	185.761
Heavy Trucks:	185.766

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-8.65	-1.20	*-0.03*	0.000	0.000
Medium Trucks:	82.53	-7.09	-8.65	-1.20	*-0.12*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-8.65	-1.20	*-0.59*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.6	70.0	70.6
Medium Trucks:	65.6	64.1	57.7	56.2	64.6	64.9
Heavy Trucks:	73.0	71.6	62.6	63.8	72.2	72.3
Vehicle Noise:	75.6	74.0	68.9	66.3	74.7	75.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.6	70.0	70.6
Medium Trucks:	65.6	64.1	57.7	56.2	64.6	64.9
Heavy Trucks:	73.0	71.6	62.6	63.8	72.2	72.3
Vehicle Noise:	75.6	74.0	68.9	66.3	74.7	75.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: I-10
Lot No: Phase 2 200' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	300.0 feet
Barrier Distance to Observer:	200.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	256.953
Medium Trucks:	256.919
Heavy Trucks:	256.922

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-10.77	-1.20	*-0.01*	0.000	0.000
Medium Trucks:	82.53	-7.09	-10.77	-1.20	*-0.09*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-10.77	-1.20	*-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:	68.8	66.9	65.1	59.5	67.9	68.5
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.8
Heavy Trucks:	70.9	69.5	60.4	61.7	70.0	70.2
Vehicle Noise:	73.4	71.9	66.8	64.2	72.6	72.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.8	66.9	65.1	59.5	67.9	68.5
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.8
Heavy Trucks:	70.9	69.5	60.4	61.7	70.0	70.2
Vehicle Noise:	73.4	71.9	66.8	64.2	72.6	72.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: I-10
Lot No: Phase 2 325' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	425.0 feet
Barrier Distance to Observer:	325.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	382.949
Medium Trucks:	382.926
Heavy Trucks:	382.928

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-13.37	-1.20	*-0.01*	0.000	0.000
Medium Trucks:	82.53	-7.09	-13.37	-1.20	*-0.07*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-13.37	-1.20	*-0.55*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.9	65.3	65.9
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.2
Heavy Trucks:	68.3	66.9	57.8	59.1	67.4	67.6
Vehicle Noise:	70.8	69.3	64.2	61.6	70.0	70.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.9	65.3	65.9
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.2
Heavy Trucks:	68.3	66.9	57.8	59.1	67.4	67.6
Vehicle Noise:	70.8	69.3	64.2	61.6	70.0	70.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: I-10
Lot No: Phase 2 800' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	900.0 feet
Barrier Distance to Observer:	800.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	859.084
Medium Trucks:	859.074
Heavy Trucks:	859.075

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-18.63	-1.20	*0.00*	0.000	0.000
Medium Trucks:	82.53	-7.09	-18.63	-1.20	*-0.05*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-18.63	-1.20	*-0.53*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.9	59.0	57.3	51.6	60.0	60.6
Medium Trucks:	55.6	54.1	47.7	46.2	54.7	54.9
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	65.6	64.0	58.9	56.3	64.7	65.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.9	59.0	57.3	51.6	60.0	60.6
Medium Trucks:	55.6	54.1	47.7	46.2	54.7	54.9
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	65.6	64.0	58.9	56.3	64.7	65.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Avenue 43
Lot No: Phase 2 s/o Ave 43

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	35.972
Medium Trucks:	35.725
Heavy Trucks:	35.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	2.04	-1.20	*-0.83*	0.000	0.000
Medium Trucks:	77.62	-20.50	2.09	-1.20	*-1.15*	0.000	0.000
Heavy Trucks:	82.14	-24.45	2.08	-1.20	*-2.17*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.9	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	58.0	56.5	50.1	48.6	57.1	57.3
Heavy Trucks:	58.6	57.1	48.1	49.4	57.7	57.8
Vehicle Noise:	68.0	66.2	63.6	58.4	66.9	67.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.9	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	58.0	56.5	50.1	48.6	57.1	57.3
Heavy Trucks:	58.6	57.1	48.1	49.4	57.7	57.8
Vehicle Noise:	68.0	66.2	63.6	58.4	66.9	67.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 2 w/o Calhoun St n/o Hopi St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	35.972
Medium Trucks:	35.725
Heavy Trucks:	35.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	2.04	-1.20	*-0.83*	0.000	0.000
Medium Trucks:	74.83	-23.18	2.09	-1.20	*-1.15*	0.000	0.000
Heavy Trucks:	80.05	-27.14	2.08	-1.20	*-2.17*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 2 w/o Calhoun St s/o Hopi St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	35.972
Medium Trucks:	35.725
Heavy Trucks:	35.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	2.04	-1.20	*-0.83*	0.000	0.000
Medium Trucks:	74.83	-23.18	2.09	-1.20	*-1.15*	0.000	0.000
Heavy Trucks:	80.05	-27.14	2.08	-1.20	*-2.17*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.1	56.3	50.3	58.9	59.5
Medium Trucks:	52.5	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	53.8	52.4	43.3	44.6	52.9	53.1
Vehicle Noise:	61.5	59.8	56.8	51.9	60.5	61.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Avenue 43
Lot No: Phase 1 Main Swimming Pool

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	360.0 feet
Barrier Distance to Observer:	323.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	349.893
Medium Trucks:	349.868
Heavy Trucks:	349.870

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	-12.78	-1.20	*0.00*	0.000	0.000
Medium Trucks:	77.62	-20.50	-12.78	-1.20	*-0.12*	0.000	0.000
Heavy Trucks:	82.14	-24.45	-12.78	-1.20	*-1.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.1	50.2	48.4	42.4	51.0	51.6
Medium Trucks:	43.1	41.6	35.3	33.7	42.2	42.4
Heavy Trucks:	43.7	42.3	33.3	34.5	42.9	43.0
Vehicle Noise:	53.2	51.4	48.8	43.5	52.1	52.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.1	50.2	48.4	42.4	51.0	51.6
Medium Trucks:	43.1	41.6	35.3	33.7	42.2	42.4
Heavy Trucks:	43.7	42.3	33.3	34.5	42.9	43.0
Vehicle Noise:	53.2	51.4	48.8	43.5	52.1	52.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 1 west Swimming Pool

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	260.0 feet
Barrier Distance to Observer:	223.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	249.850
Medium Trucks:	249.815
Heavy Trucks:	249.818

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	-10.58	-1.20	*-0.01*	0.000	0.000
Medium Trucks:	74.83	-23.18	-10.58	-1.20	*-0.14*	0.000	0.000
Heavy Trucks:	80.05	-27.14	-10.58	-1.20	*-1.17*	0.000	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	43.7	37.7	46.3	46.9
Medium Trucks:	39.9	38.4	32.0	30.4	38.9	39.1
Heavy Trucks:	41.1	39.7	30.7	31.9	40.3	40.4
Vehicle Noise:	48.9	47.1	44.2	39.3	47.8	48.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.4	45.5	43.7	37.7	46.3	46.9
Medium Trucks:	39.9	38.4	32.0	30.4	38.9	39.1
Heavy Trucks:	41.1	39.7	30.7	31.9	40.3	40.4
Vehicle Noise:	48.9	47.1	44.2	39.3	47.8	48.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Avenue 43
Lot No: Phase 1 s/o Ave 43

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	37.496
Heavy Trucks:	36.124

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	1.64	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	77.62	-20.50	1.77	-1.20	*-5.38*	0.000	0.000
Heavy Trucks:	82.14	-24.45	2.01	-1.20	*-7.71*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.5	64.6	62.9	56.8	65.4	66.0
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	58.5	57.1	48.0	49.3	57.7	57.8
Vehicle Noise:	67.6	65.8	63.2	58.0	66.6	67.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.5	64.6	62.9	56.8	65.4	66.0
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	58.5	57.1	48.0	49.3	57.7	57.8
Vehicle Noise:	67.6	65.8	63.2	58.0	66.6	67.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 1 e/o Calhoun St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	37.496
Heavy Trucks:	36.124

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	1.64	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	74.83	-23.18	1.77	-1.20	*-5.38*	0.000	0.000
Heavy Trucks:	80.05	-27.14	2.01	-1.20	*-7.71*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.6	57.7	55.9	49.9	58.5	59.1
Medium Trucks:	52.2	50.7	44.3	42.8	51.3	51.5
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	61.2	59.4	56.4	51.6	60.2	60.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.6	57.7	55.9	49.9	58.5	59.1
Medium Trucks:	52.2	50.7	44.3	42.8	51.3	51.5
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	61.2	59.4	56.4	51.6	60.2	60.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: I-10
Lot No: Phase 2 Edge of Project Site to I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	46.861
Medium Trucks:	46.227
Heavy Trucks:	45.121

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	0.32	-1.20	*-12.12*	0.000	0.000
Medium Trucks:	82.53	-7.09	0.41	-1.20	*-12.63*	0.000	0.000
Heavy Trucks:	85.83	-2.96	0.57	-1.20	*-13.93*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	79.9	78.0	76.2	70.6	79.0	79.6
Medium Trucks:	74.6	73.1	66.8	65.2	73.7	73.9
Heavy Trucks:	82.2	80.8	71.8	73.0	81.4	81.5
Vehicle Noise:	84.7	83.1	77.9	75.4	83.8	84.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	79.9	78.0	76.2	70.6	79.0	79.6
Medium Trucks:	74.6	73.1	66.8	65.2	73.7	73.9
Heavy Trucks:	82.2	80.8	71.8	73.0	81.4	81.5
Vehicle Noise:	84.7	83.1	77.9	75.4	83.8	84.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: I-10
Lot No: Phase 2 35' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	135.0 feet
Barrier Distance to Observer:	35.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	87.298
Medium Trucks:	86.960
Heavy Trucks:	86.377

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-3.73	-1.20	*-1.63*	0.000	0.000
Medium Trucks:	82.53	-7.09	-3.71	-1.20	*-1.98*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-3.66	-1.20	*-2.97*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.8	73.9	72.2	66.5	74.9	75.5
Medium Trucks:	70.5	69.0	62.7	61.1	69.6	69.8
Heavy Trucks:	78.0	76.6	67.5	68.8	77.1	77.3
Vehicle Noise:	80.5	78.9	73.8	71.2	79.6	79.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.8	73.9	72.2	66.5	74.9	75.5
Medium Trucks:	70.5	69.0	62.7	61.1	69.6	69.8
Heavy Trucks:	78.0	76.6	67.5	68.8	77.1	77.3
Vehicle Noise:	80.5	78.9	73.8	71.2	79.6	79.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: I-10
Lot No: Phase 2 130' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	230.0 feet
Barrier Distance to Observer:	130.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	186.269
Medium Trucks:	186.110
Heavy Trucks:	185.838

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-8.67	-1.20	*-0.23*	0.000	0.000
Medium Trucks:	82.53	-7.09	-8.67	-1.20	*-0.43*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-8.66	-1.20	*-1.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.6	70.0	70.6
Medium Trucks:	65.6	64.1	57.7	56.2	64.6	64.9
Heavy Trucks:	73.0	71.6	62.6	63.8	72.2	72.3
Vehicle Noise:	75.6	74.0	68.9	66.3	74.7	75.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.6	70.0	70.6
Medium Trucks:	65.6	64.1	57.7	56.2	64.6	64.9
Heavy Trucks:	73.0	71.6	62.6	63.8	72.2	72.3
Vehicle Noise:	75.6	74.0	68.9	66.3	74.7	75.0

Tuesday, October 18, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: I-10
Lot No: Phase 2 200' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	300.0 feet
Barrier Distance to Observer:	200.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	257.286
Medium Trucks:	257.171
Heavy Trucks:	256.975

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-10.78	-1.20	*-0.11*	0.000	0.000
Medium Trucks:	82.53	-7.09	-10.77	-1.20	*-0.26*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-10.77	-1.20	*-0.93*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.8	66.9	65.1	59.5	67.9	68.5
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.7
Heavy Trucks:	70.9	69.5	60.4	61.7	70.0	70.2
Vehicle Noise:	73.4	71.9	66.7	64.2	72.6	72.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.8	66.9	65.1	59.5	67.9	68.5
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.7
Heavy Trucks:	70.9	69.5	60.4	61.7	70.0	70.2
Vehicle Noise:	73.4	71.9	66.7	64.2	72.6	72.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: I-10
Lot No: Phase 2 325' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	7,600	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	80	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	425.0	feet
Barrier Distance to Observer:	325.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	383.172
Medium Trucks:	383.095
Heavy Trucks:	382.963

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-13.37	-1.20	*-0.05*	0.000	0.000
Medium Trucks:	82.53	-7.09	-13.37	-1.20	*-0.16*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-13.37	-1.20	*-0.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.9	65.3	65.9
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.2
Heavy Trucks:	68.3	66.9	57.8	59.1	67.4	67.6
Vehicle Noise:	70.8	69.3	64.1	61.6	70.0	70.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.9	65.3	65.9
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.2
Heavy Trucks:	68.3	66.9	57.8	59.1	67.4	67.6
Vehicle Noise:	70.8	69.3	64.1	61.6	70.0	70.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: I-10
Lot No: Phase 2 800' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	900.0 feet
Barrier Distance to Observer:	800.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	859.183
Medium Trucks:	859.149
Heavy Trucks:	859.090

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-18.63	-1.20	*-0.01*	0.000	0.000
Medium Trucks:	82.53	-7.09	-18.63	-1.20	*-0.08*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-18.63	-1.20	*-0.62*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.9	59.0	57.3	51.6	60.0	60.6
Medium Trucks:	55.6	54.1	47.7	46.2	54.7	54.9
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	65.6	64.0	58.9	56.3	64.7	65.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.9	59.0	57.3	51.6	60.0	60.6
Medium Trucks:	55.6	54.1	47.7	46.2	54.7	54.9
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	65.6	64.0	58.9	56.3	64.7	65.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Avenue 43
Lot No: Phase 2 s/o Ave 43

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	37.496
Heavy Trucks:	36.124

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	1.64	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	77.62	-20.50	1.77	-1.20	*-5.38*	0.000	0.000
Heavy Trucks:	82.14	-24.45	2.01	-1.20	*-7.71*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.5	64.6	62.9	56.8	65.4	66.0
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	58.5	57.1	48.0	49.3	57.7	57.8
Vehicle Noise:	67.6	65.8	63.2	58.0	66.6	67.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.5	64.6	62.9	56.8	65.4	66.0
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	58.5	57.1	48.0	49.3	57.7	57.8
Vehicle Noise:	67.6	65.8	63.2	58.0	66.6	67.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 2 w/o Calhoun St n/o Hopi St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	37.496
Heavy Trucks:	36.124

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	1.64	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	74.83	-23.18	1.77	-1.20	*-5.38*	0.000	0.000
Heavy Trucks:	80.05	-27.14	2.01	-1.20	*-7.71*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.6	57.7	55.9	49.9	58.5	59.1
Medium Trucks:	52.2	50.7	44.3	42.8	51.3	51.5
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	61.2	59.4	56.4	51.6	60.2	60.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.6	57.7	55.9	49.9	58.5	59.1
Medium Trucks:	52.2	50.7	44.3	42.8	51.3	51.5
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	61.2	59.4	56.4	51.6	60.2	60.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 2 w/o Calhoun St s/o Hopi St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	37.496
Heavy Trucks:	36.124

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	1.64	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	74.83	-23.18	1.77	-1.20	*-5.38*	0.000	0.000
Heavy Trucks:	80.05	-27.14	2.01	-1.20	*-7.71*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.6	57.7	55.9	49.9	58.5	59.1
Medium Trucks:	52.2	50.7	44.3	42.8	51.3	51.5
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	61.2	59.4	56.4	51.6	60.2	60.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.6	57.7	55.9	49.9	58.5	59.1
Medium Trucks:	52.2	50.7	44.3	42.8	51.3	51.5
Heavy Trucks:	53.7	52.3	43.3	44.5	52.9	53.0
Vehicle Noise:	61.2	59.4	56.4	51.6	60.2	60.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Avenue 43
Lot No: Phase 1 Main Swimming Pool

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	360.0 feet
Barrier Distance to Observer:	323.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	350.137
Medium Trucks:	350.053
Heavy Trucks:	349.908

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	-12.78	-1.20	*-0.02*	0.000	0.000
Medium Trucks:	77.62	-20.50	-12.78	-1.20	*-0.20*	0.000	0.000
Heavy Trucks:	82.14	-24.45	-12.78	-1.20	*-1.38*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.1	50.2	48.4	42.4	51.0	51.6
Medium Trucks:	43.1	41.6	35.3	33.7	42.2	42.4
Heavy Trucks:	43.7	42.3	33.3	34.5	42.9	43.0
Vehicle Noise:	53.1	51.3	48.8	43.5	52.1	52.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.1	50.2	48.4	42.4	51.0	51.6
Medium Trucks:	43.1	41.6	35.3	33.7	42.2	42.4
Heavy Trucks:	43.7	42.3	33.3	34.5	42.9	43.0
Vehicle Noise:	53.1	51.3	48.8	43.5	52.1	52.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 1 west Swimming Pool

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	260.0 feet
Barrier Distance to Observer:	223.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	250.192
Medium Trucks:	250.074
Heavy Trucks:	249.872

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	-10.59	-1.20	*-0.05*	0.000	0.000
Medium Trucks:	74.83	-23.18	-10.59	-1.20	*-0.26*	0.000	0.000
Heavy Trucks:	80.05	-27.14	-10.58	-1.20	*-1.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.4	45.5	43.7	37.7	46.3	46.9
Medium Trucks:	39.9	38.3	32.0	30.4	38.9	39.1
Heavy Trucks:	41.1	39.7	30.7	31.9	40.3	40.4
Vehicle Noise:	48.9	47.1	44.2	39.3	47.8	48.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.4	45.5	43.7	37.7	46.3	46.9
Medium Trucks:	39.9	38.3	32.0	30.4	38.9	39.1
Heavy Trucks:	41.1	39.7	30.7	31.9	40.3	40.4
Vehicle Noise:	48.9	47.1	44.2	39.3	47.8	48.3

Tuesday, October 18, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Avenue 43
Lot No: Phase 1 s/o Ave 43

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	42.403
Medium Trucks:	41.202
Heavy Trucks:	38.650

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	0.97	-1.20	*-8.33*	0.000	0.000
Medium Trucks:	77.62	-20.50	1.16	-1.20	*-9.57*	0.000	0.000
Heavy Trucks:	82.14	-24.45	1.57	-1.20	*-13.03*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.9	64.0	62.2	56.1	64.8	65.4
Medium Trucks:	57.1	55.6	49.2	47.7	56.1	56.4
Heavy Trucks:	58.1	56.6	47.6	48.9	57.2	57.3
Vehicle Noise:	67.0	65.2	62.5	57.4	65.9	66.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.9	64.0	62.2	56.1	64.8	65.4
Medium Trucks:	57.1	55.6	49.2	47.7	56.1	56.4
Heavy Trucks:	58.1	56.6	47.6	48.9	57.2	57.3
Vehicle Noise:	67.0	65.2	62.5	57.4	65.9	66.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 1 e/o Calhoun St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	42.403
Medium Trucks:	41.202
Heavy Trucks:	38.650

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	0.97	-1.20	*-8.33*	0.000	0.000
Medium Trucks:	74.83	-23.18	1.16	-1.20	*-9.57*	0.000	0.000
Heavy Trucks:	80.05	-27.14	1.57	-1.20	*-13.03*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.9	57.0	55.3	49.2	57.8	58.4
Medium Trucks:	51.6	50.1	43.7	42.2	50.6	50.9
Heavy Trucks:	53.3	51.9	42.8	44.1	52.4	52.6
Vehicle Noise:	60.6	58.8	55.8	51.0	59.5	60.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.9	57.0	55.3	49.2	57.8	58.4
Medium Trucks:	51.6	50.1	43.7	42.2	50.6	50.9
Heavy Trucks:	53.3	51.9	42.8	44.1	52.4	52.6
Vehicle Noise:	60.6	58.8	55.8	51.0	59.5	60.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: I-10
Lot No: Phase 2 Edge of Project Site to I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	50.289
Medium Trucks:	49.281
Heavy Trucks:	47.168

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-0.14	-1.20	*-18.34*	0.000	0.000
Medium Trucks:	82.53	-7.09	-0.01	-1.20	*-19.15*	0.000	0.000
Heavy Trucks:	85.83	-2.96	0.28	-1.20	*-21.22*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	79.4	77.5	75.8	70.1	78.5	79.1
Medium Trucks:	74.2	72.7	66.4	64.8	73.3	73.5
Heavy Trucks:	81.9	80.5	71.5	72.7	81.1	81.2
Vehicle Noise:	84.3	82.7	77.5	75.1	83.4	83.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	79.4	77.5	75.8	70.1	78.5	79.1
Medium Trucks:	74.2	72.7	66.4	64.8	73.3	73.5
Heavy Trucks:	81.9	80.5	71.5	72.7	81.1	81.2
Vehicle Noise:	84.3	82.7	77.5	75.1	83.4	83.7

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: I-10
Lot No: Phase 2 35' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	135.0 feet
Barrier Distance to Observer:	35.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	89.185
Medium Trucks:	88.621
Heavy Trucks:	87.463

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-3.87	-1.20	*-4.05*	0.000	0.000
Medium Trucks:	82.53	-7.09	-3.83	-1.20	*-4.59*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-3.75	-1.20	*-6.10*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.7	73.8	72.0	66.4	74.8	75.4
Medium Trucks:	70.4	68.9	62.5	61.0	69.5	69.7
Heavy Trucks:	77.9	76.5	67.5	68.7	77.1	77.2
Vehicle Noise:	80.4	78.8	73.7	71.1	79.5	79.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.7	73.8	72.0	66.4	74.8	75.4
Medium Trucks:	70.4	68.9	62.5	61.0	69.5	69.7
Heavy Trucks:	77.9	76.5	67.5	68.7	77.1	77.2
Vehicle Noise:	80.4	78.8	73.7	71.1	79.5	79.8

Tuesday, October 18, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: I-10
Lot No: Phase 2 130' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	7,600	vehicles
Vehicle Speed:	70	mph
Near/Far Lane Distance:	80	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	230.0	feet
Barrier Distance to Observer:	130.0	feet
Observer Height (Above Pad):	23.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	187.160
Medium Trucks:	186.892
Heavy Trucks:	186.346

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-8.70	-1.20	*-0.62*	0.000	0.000
Medium Trucks:	82.53	-7.09	-8.69	-1.20	*-0.92*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-8.67	-1.20	*-1.92*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.5	70.0	70.6
Medium Trucks:	65.5	64.0	57.7	56.1	64.6	64.8
Heavy Trucks:	73.0	71.6	62.5	63.8	72.1	72.3
Vehicle Noise:	75.5	73.9	68.8	66.3	74.7	74.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.5	70.0	70.6
Medium Trucks:	65.5	64.0	57.7	56.1	64.6	64.8
Heavy Trucks:	73.0	71.6	62.5	63.8	72.1	72.3
Vehicle Noise:	75.5	73.9	68.8	66.3	74.7	74.9

Tuesday, October 18, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: I-10
Lot No: Phase 2 200' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	300.0 feet
Barrier Distance to Observer:	200.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	257.932
Medium Trucks:	257.737
Heavy Trucks:	257.342

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-10.79	-1.20	*-0.30*	0.000	0.000
Medium Trucks:	82.53	-7.09	-10.79	-1.20	*-0.53*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-10.78	-1.20	*-1.39*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.8	66.9	65.1	59.4	67.9	68.5
Medium Trucks:	63.5	61.9	55.6	54.0	62.5	62.7
Heavy Trucks:	70.9	69.5	60.4	61.7	70.0	70.2
Vehicle Noise:	73.4	71.8	66.7	64.2	72.6	72.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.8	66.9	65.1	59.4	67.9	68.5
Medium Trucks:	63.5	61.9	55.6	54.0	62.5	62.7
Heavy Trucks:	70.9	69.5	60.4	61.7	70.0	70.2
Vehicle Noise:	73.4	71.8	66.7	64.2	72.6	72.8

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: I-10
Lot No: Phase 2 325' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	425.0 feet
Barrier Distance to Observer:	325.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	383.607
Medium Trucks:	383.476
Heavy Trucks:	383.210

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-13.38	-1.20	*-0.12*	0.000	0.000
Medium Trucks:	82.53	-7.09	-13.37	-1.20	*-0.29*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-13.37	-1.20	*-1.03*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.9	65.3	65.9
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.1
Heavy Trucks:	68.3	66.9	57.8	59.1	67.4	67.6
Vehicle Noise:	70.8	69.3	64.1	61.6	70.0	70.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.9	65.3	65.9
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.1
Heavy Trucks:	68.3	66.9	57.8	59.1	67.4	67.6
Vehicle Noise:	70.8	69.3	64.1	61.6	70.0	70.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: I-10
Lot No: Phase 2 800' Setback from I-10

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	76,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,600 vehicles
Vehicle Speed:	70 mph
Near/Far Lane Distance:	80 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	900.0 feet
Barrier Distance to Observer:	800.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	10.5%	78.10%
Medium Trucks:	84.8%	4.9%	10.3%	6.10%
Heavy Trucks:	86.5%	2.7%	10.8%	15.80%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	859.377
Medium Trucks:	859.319
Heavy Trucks:	859.200

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	76.79	3.98	-18.63	-1.20	*-0.02*	0.000	0.000
Medium Trucks:	82.53	-7.09	-18.63	-1.20	*-0.12*	0.000	0.000
Heavy Trucks:	85.83	-2.96	-18.63	-1.20	*-0.72*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.9	59.0	57.3	51.6	60.0	60.6
Medium Trucks:	55.6	54.1	47.7	46.2	54.7	54.9
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	65.6	64.0	58.9	56.3	64.7	65.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.9	59.0	57.3	51.6	60.0	60.6
Medium Trucks:	55.6	54.1	47.7	46.2	54.7	54.9
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	65.6	64.0	58.9	56.3	64.7	65.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Avenue 43
Lot No: Phase 2 s/o Ave 43

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	42.403
Medium Trucks:	41.202
Heavy Trucks:	38.650

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	0.97	-1.20	*-8.33*	0.000	0.000
Medium Trucks:	77.62	-20.50	1.16	-1.20	*-9.57*	0.000	0.000
Heavy Trucks:	82.14	-24.45	1.57	-1.20	*-13.03*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.9	64.0	62.2	56.1	64.8	65.4
Medium Trucks:	57.1	55.6	49.2	47.7	56.1	56.4
Heavy Trucks:	58.1	56.6	47.6	48.9	57.2	57.3
Vehicle Noise:	67.0	65.2	62.5	57.4	65.9	66.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.9	64.0	62.2	56.1	64.8	65.4
Medium Trucks:	57.1	55.6	49.2	47.7	56.1	56.4
Heavy Trucks:	58.1	56.6	47.6	48.9	57.2	57.3
Vehicle Noise:	67.0	65.2	62.5	57.4	65.9	66.4

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 2 w/o Calhoun St n/o Hopi St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	42.403
Medium Trucks:	41.202
Heavy Trucks:	38.650

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	0.97	-1.20	*-8.33*	0.000	0.000
Medium Trucks:	74.83	-23.18	1.16	-1.20	*-9.57*	0.000	0.000
Heavy Trucks:	80.05	-27.14	1.57	-1.20	*-13.03*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.9	57.0	55.3	49.2	57.8	58.4
Medium Trucks:	51.6	50.1	43.7	42.2	50.6	50.9
Heavy Trucks:	53.3	51.9	42.8	44.1	52.4	52.6
Vehicle Noise:	60.6	58.8	55.8	51.0	59.5	60.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.9	57.0	55.3	49.2	57.8	58.4
Medium Trucks:	51.6	50.1	43.7	42.2	50.6	50.9
Heavy Trucks:	53.3	51.9	42.8	44.1	52.4	52.6
Vehicle Noise:	60.6	58.8	55.8	51.0	59.5	60.0

Tuesday, October 18, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 2 w/o Calhoun St s/o Hopi St

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	42.403
Medium Trucks:	41.202
Heavy Trucks:	38.650

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	0.97	-1.20	*-8.33*	0.000	0.000
Medium Trucks:	74.83	-23.18	1.16	-1.20	*-9.57*	0.000	0.000
Heavy Trucks:	80.05	-27.14	1.57	-1.20	*-13.03*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.9	57.0	55.3	49.2	57.8	58.4
Medium Trucks:	51.6	50.1	43.7	42.2	50.6	50.9
Heavy Trucks:	53.3	51.9	42.8	44.1	52.4	52.6
Vehicle Noise:	60.6	58.8	55.8	51.0	59.5	60.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.9	57.0	55.3	49.2	57.8	58.4
Medium Trucks:	51.6	50.1	43.7	42.2	50.6	50.9
Heavy Trucks:	53.3	51.9	42.8	44.1	52.4	52.6
Vehicle Noise:	60.6	58.8	55.8	51.0	59.5	60.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Avenue 43
Lot No: Phase 1 Main Swimming Pool

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	740 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	360.0 feet
Barrier Distance to Observer:	323.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	350.612
Medium Trucks:	350.469
Heavy Trucks:	350.178

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-3.26	-12.79	-1.20	*-0.06*	0.000	0.000
Medium Trucks:	77.62	-20.50	-12.79	-1.20	*-0.30*	0.000	0.000
Heavy Trucks:	82.14	-24.45	-12.78	-1.20	*-1.62*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.1	50.2	48.4	42.4	51.0	51.6
Medium Trucks:	43.1	41.6	35.3	33.7	42.2	42.4
Heavy Trucks:	43.7	42.3	33.2	34.5	42.9	43.0
Vehicle Noise:	53.1	51.3	48.8	43.5	52.1	52.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.1	50.2	48.4	42.4	51.0	51.6
Medium Trucks:	43.1	41.6	35.3	33.7	42.2	42.4
Heavy Trucks:	43.7	42.3	33.2	34.5	42.9	43.0
Vehicle Noise:	53.1	51.3	48.8	43.5	52.1	52.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Calhoun Street
Lot No: Phase 1 west Swimming Pool

Project Name: Ave 42 and Calhoun
Job Number: 14744
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	260.0 feet
Barrier Distance to Observer:	223.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	250.857
Medium Trucks:	250.656
Heavy Trucks:	250.250

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-5.95	-10.61	-1.20	*-0.12*	0.000	0.000
Medium Trucks:	74.83	-23.18	-10.61	-1.20	*-0.42*	0.000	0.000
Heavy Trucks:	80.05	-27.14	-10.59	-1.20	*-1.85*	0.000	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	43.7	37.6	46.3	46.9
Medium Trucks:	39.8	38.3	32.0	30.4	38.9	39.1
Heavy Trucks:	41.1	39.7	30.7	31.9	40.3	40.4
Vehicle Noise:	48.9	47.1	44.2	39.3	47.8	48.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.4	45.5	43.7	37.6	46.3	46.9
Medium Trucks:	39.8	38.3	32.0	30.4	38.9	39.1
Heavy Trucks:	41.1	39.7	30.7	31.9	40.3	40.4
Vehicle Noise:	48.9	47.1	44.2	39.3	47.8	48.3

APPENDIX 8.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Avenue 42
Road Segment: w/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,500 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	680 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, 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:	52.211
Medium Trucks:	52.041
Heavy Trucks:	52.058

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.87	-0.39	-1.20	*-4.67*	0.000	0.000
Medium Trucks:	79.45	-18.74	-0.36	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-16.52	-0.37	-1.20	*-5.38*	0.000	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	62.1	60.7	54.6	63.1	63.7
Medium Trucks:	59.1	56.1	48.4	57.6	63.7	63.7
Heavy Trucks:	66.2	63.2	55.4	64.6	70.7	70.8
Vehicle Noise:	68.4	66.1	62.0	65.7	72.1	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	76	164	353	760
CNEL:	77	167	359	773

Sunday, July 17, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Avenue 42
Road Segment: e/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,300 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	504 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, 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:	52.211
Medium Trucks:	52.041
Heavy Trucks:	52.058

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-5.18	-0.39	-1.20	*-4.67*	0.000	0.000
Medium Trucks:	79.45	-20.04	-0.36	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-17.82	-0.37	-1.20	*-5.38*	0.000	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	60.8	59.4	53.3	61.8	62.4
Medium Trucks:	57.8	54.8	47.1	56.3	62.4	62.4
Heavy Trucks:	64.9	61.9	54.1	63.3	69.4	69.5
Vehicle Noise:	67.1	64.8	60.7	64.4	70.8	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	62	134	289	622
CNEL:	63	136	294	633

Sunday, July 17, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Avenue 43
Road Segment: w/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,100 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	328 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-5.03	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-22.27	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-26.23	1.92	-1.20	*-5.61*	0.000	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	56.4	55.1	49.0	57.5	58.1
Medium Trucks:	51.9	49.0	41.5	50.3	56.4	56.5
Heavy Trucks:	54.4	51.3	47.9	52.6	58.8	58.9
Vehicle Noise:	59.9	58.1	56.0	55.7	62.4	62.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	12	25	54	116
CNEL:	12	26	56	121

Sunday, July 17, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Avenue 43
Road Segment: e/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,700 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	376 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-4.44	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-21.68	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-25.63	1.92	-1.20	*-5.61*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.0	57.0	55.6	49.6	58.1	58.7
Medium Trucks:	52.5	49.6	42.1	50.9	57.0	57.1
Heavy Trucks:	55.0	51.9	48.5	53.2	59.4	59.5
Vehicle Noise:	60.5	58.7	56.6	56.3	63.0	63.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	13	27	59	127
CNEL:	13	28	61	132

Sunday, July 17, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Calhoun Street
Road Segment: s/o Avenue 42

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,700 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	136 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-8.85	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-26.09	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-30.05	1.92	-1.20	*-5.61*	0.000	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	52.5	51.2	45.2	53.6	54.3
Medium Trucks:	48.1	45.2	37.7	46.4	52.6	52.6
Heavy Trucks:	50.6	47.5	44.1	48.8	55.0	55.1
Vehicle Noise:	56.1	54.3	52.2	51.8	58.6	58.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	14	30	64
CNEL:	7	14	31	67

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Calhoun Street
Road Segment: s/o Avenue 43

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	0 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-41.16	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-58.40	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-62.35	1.92	-1.20	*-5.61*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	21.3	20.2	18.9	12.9	21.3	22.0
Medium Trucks:	15.8	12.9	5.4	14.1	20.3	20.3
Heavy Trucks:	18.3	15.2	11.8	16.5	22.7	22.8
Vehicle Noise:	23.8	22.0	19.9	19.5	26.3	26.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	0	0	0	0
CNEL:	0	0	0	0

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Avenue 42
Road Segment: w/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,800 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	944 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, 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:	52.211
Medium Trucks:	52.041
Heavy Trucks:	52.058

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.45	-0.39	-1.20	*-4.67*	0.000	0.000
Medium Trucks:	79.45	-17.32	-0.36	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-15.10	-0.37	-1.20	*-5.38*	0.000	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	63.5	62.1	56.1	64.5	65.1
Medium Trucks:	60.6	57.6	49.8	59.0	65.1	65.2
Heavy Trucks:	67.6	64.6	56.8	66.0	72.2	72.2
Vehicle Noise:	69.8	67.5	63.4	67.1	73.5	73.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	95	204	439	946
CNEL:	96	207	447	962

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Avenue 42
Road Segment: e/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,700 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	536 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, 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:	52.211
Medium Trucks:	52.041
Heavy Trucks:	52.058

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-4.91	-0.39	-1.20	*-4.67*	0.000	0.000
Medium Trucks:	79.45	-19.77	-0.36	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-17.56	-0.37	-1.20	*-5.38*	0.000	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	61.0	59.6	53.6	62.1	62.7
Medium Trucks:	58.1	55.1	47.3	56.5	62.7	62.7
Heavy Trucks:	65.1	62.1	54.3	63.5	69.7	69.7
Vehicle Noise:	67.4	65.1	60.9	64.7	71.1	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	65	140	301	648
CNEL:	66	142	306	660

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Avenue 43
Road Segment: w/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,900 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	552 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-2.77	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-20.01	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-23.96	1.92	-1.20	*-5.61*	0.000	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	58.6	57.3	51.3	59.7	60.3
Medium Trucks:	54.2	51.3	43.8	52.5	58.7	58.7
Heavy Trucks:	56.7	53.6	50.2	54.9	61.1	61.1
Vehicle Noise:	62.2	60.4	58.2	57.9	64.7	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	16	35	76	164
CNEL:	17	37	79	171

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Avenue 43
Road Segment: e/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,700 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	536 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-2.90	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-20.14	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-24.09	1.92	-1.20	*-5.61*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.5	58.5	57.2	51.2	59.6	60.2
Medium Trucks:	54.1	51.1	43.6	52.4	58.6	58.6
Heavy Trucks:	56.6	53.5	50.1	54.7	60.9	61.0
Vehicle Noise:	62.1	60.3	58.1	57.8	64.6	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	16	35	75	161
CNEL:	17	36	78	167

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Calhoun Street
Road Segment: s/o Avenue 42

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,300 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	424 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-3.92	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-21.15	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-25.11	1.92	-1.20	*-5.61*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.5	57.5	56.2	50.2	58.6	59.2
Medium Trucks:	53.1	50.1	42.6	51.4	57.5	57.6
Heavy Trucks:	55.5	52.5	49.1	53.7	59.9	60.0
Vehicle Noise:	61.0	59.2	57.1	56.8	63.6	63.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	14	30	64	138
CNEL:	14	31	66	143

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Calhoun Street
Road Segment: s/o Avenue 43

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	248 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-6.25	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-23.48	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-27.44	1.92	-1.20	*-5.61*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	56.2	55.1	53.8	47.8	56.2	56.9
Medium Trucks:	50.7	47.8	40.3	49.0	55.2	55.3
Heavy Trucks:	53.2	50.1	46.7	51.4	57.6	57.7
Vehicle Noise:	58.7	56.9	54.8	54.4	61.2	61.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	10	21	45	96
CNEL:	10	22	46	100

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Avenue 42
Road Segment: w/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,800 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	1,504 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, 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:	52.211
Medium Trucks:	52.041
Heavy Trucks:	52.058

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.43	-0.39	-1.20	*-4.67*	0.000	0.000
Medium Trucks:	79.45	-15.29	-0.36	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-13.08	-0.37	-1.20	*-5.38*	0.000	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	65.5	64.1	58.1	66.5	67.2
Medium Trucks:	62.6	59.6	51.8	61.0	67.2	67.2
Heavy Trucks:	69.6	66.6	58.8	68.0	74.2	74.2
Vehicle Noise:	71.9	69.6	65.4	69.2	75.6	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	129	278	599	1,290
CNEL:	131	283	609	1,312

Sunday, July 17, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Avenue 42
Road Segment: e/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,300 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	1,304 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, 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:	52.211
Medium Trucks:	52.041
Heavy Trucks:	52.058

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.05	-0.39	-1.20	*-4.67*	0.000	0.000
Medium Trucks:	79.45	-15.91	-0.36	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-13.70	-0.37	-1.20	*-5.38*	0.000	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	64.9	63.5	57.5	65.9	66.6
Medium Trucks:	62.0	59.0	51.2	60.4	66.5	66.6
Heavy Trucks:	69.0	66.0	58.2	67.4	73.6	73.6
Vehicle Noise:	71.2	68.9	64.8	68.5	74.9	75.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	117	253	544	1,173
CNEL:	119	257	554	1,193

Sunday, July 17, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Avenue 43
Road Segment: w/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,500 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	360 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-4.63	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-21.87	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-25.82	1.92	-1.20	*-5.61*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	57.8	56.8	55.5	49.4	57.9	58.5
Medium Trucks:	52.3	49.4	41.9	50.7	56.8	56.9
Heavy Trucks:	54.8	51.7	48.4	53.0	59.2	59.3
Vehicle Noise:	60.3	58.5	56.4	56.1	62.8	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	12	27	57	123
CNEL:	13	28	60	128

Sunday, July 17, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Avenue 43
Road Segment: e/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,200 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	576 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-2.59	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-19.82	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-23.78	1.92	-1.20	*-5.61*	0.000	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	58.8	57.5	51.5	59.9	60.5
Medium Trucks:	54.4	51.5	44.0	52.7	58.9	58.9
Heavy Trucks:	56.9	53.8	50.4	55.0	61.2	61.3
Vehicle Noise:	62.4	60.6	58.4	58.1	64.9	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	17	36	78	169
CNEL:	18	38	81	176

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Calhoun Street
Road Segment: s/o Avenue 42

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,100 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	168 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-7.94	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-25.18	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-29.13	1.92	-1.20	*-5.61*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.5	53.5	52.1	46.1	54.6	55.2
Medium Trucks:	49.0	46.1	38.6	47.4	53.5	53.6
Heavy Trucks:	51.5	48.4	45.0	49.7	55.9	56.0
Vehicle Noise:	57.0	55.2	53.1	52.8	59.5	59.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	7	16	34	74
CNEL:	8	17	36	77

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Calhoun Street
Road Segment: s/o Avenue 43

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	0 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-41.16	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-58.40	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-62.35	1.92	-1.20	*-5.61*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	21.3	20.2	18.9	12.9	21.3	22.0
Medium Trucks:	15.8	12.9	5.4	14.1	20.3	20.3
Heavy Trucks:	18.3	15.2	11.8	16.5	22.7	22.8
Vehicle Noise:	23.8	22.0	19.9	19.5	26.3	26.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	0	0	0	0
CNEL:	0	0	0	0

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: Avenue 42
Road Segment: w/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,000	vehicles
Peak Hour Percentage:	8.00%	
Peak Hour Volume:	1,760	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	55.0	feet
Centerline Dist. to Observer:	55.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, 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:	52.211
Medium Trucks:	52.041
Heavy Trucks:	52.058

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.26	-0.39	-1.20	*-4.67*	0.000	0.000
Medium Trucks:	79.45	-14.61	-0.36	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-12.39	-0.37	-1.20	*-5.38*	0.000	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	66.2	64.8	58.8	67.2	67.9
Medium Trucks:	63.3	60.3	52.5	61.7	67.8	67.9
Heavy Trucks:	70.3	67.3	59.5	68.7	74.9	74.9
Vehicle Noise:	72.6	70.2	66.1	69.8	76.2	76.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	143	309	665	1,432
CNEL:	146	314	676	1,457

Sunday, July 17, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: Avenue 42
Road Segment: e/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,700 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	1,336 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, 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:	52.211
Medium Trucks:	52.041
Heavy Trucks:	52.058

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.94	-0.39	-1.20	*-4.67*	0.000	0.000
Medium Trucks:	79.45	-15.81	-0.36	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-13.59	-0.37	-1.20	*-5.38*	0.000	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	65.0	63.6	57.6	66.0	66.7
Medium Trucks:	62.1	59.1	51.3	60.5	66.6	66.7
Heavy Trucks:	69.1	66.1	58.3	67.5	73.7	73.7
Vehicle Noise:	71.4	69.0	64.9	68.7	75.0	75.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	119	257	553	1,192
CNEL:	121	261	563	1,213

Sunday, July 17, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: Avenue 43
Road Segment: w/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,300 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	584 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-2.53	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-19.76	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-23.72	1.92	-1.20	*-5.61*	0.000	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	58.9	57.6	51.5	60.0	60.6
Medium Trucks:	54.4	51.5	44.0	52.8	58.9	59.0
Heavy Trucks:	56.9	53.8	50.5	55.1	61.3	61.4
Vehicle Noise:	62.4	60.6	58.5	58.2	64.9	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	17	37	79	170
CNEL:	18	38	82	177

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: Avenue 43
Road Segment: e/o Calhoun Street

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	592 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-2.47	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-19.71	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-23.66	1.92	-1.20	*-5.61*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.0	58.9	57.6	51.6	60.0	60.6
Medium Trucks:	54.5	51.6	44.1	52.8	59.0	59.0
Heavy Trucks:	57.0	53.9	50.5	55.2	61.4	61.5
Vehicle Noise:	62.5	60.7	58.5	58.2	65.0	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	17	37	80	172
CNEL:	18	39	83	179

Sunday, July 17, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: Calhoun Street
Road Segment: s/o Avenue 42

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,700 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	456 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-3.60	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-20.84	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-24.79	1.92	-1.20	*-5.61*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.8	57.8	56.5	50.5	58.9	59.5
Medium Trucks:	53.4	50.4	42.9	51.7	57.9	57.9
Heavy Trucks:	55.8	52.8	49.4	54.0	60.2	60.3
Vehicle Noise:	61.4	59.6	57.4	57.1	63.9	64.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	14	31	67	144
CNEL:	15	32	70	150

Sunday, July 17, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: Calhoun Street
Road Segment: s/o Avenue 43

Project Name: Ave 42 and Calhoun
Job Number: 14744

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,100 vehicles
Peak Hour Percentage:	8.00%
Peak Hour Volume:	248 vehicles
Vehicle Speed:	30 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	-6.25	1.88	-1.20	*-4.56*	0.000	0.000
Medium Trucks:	73.48	-23.48	1.93	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-27.44	1.92	-1.20	*-5.61*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	56.2	55.1	53.8	47.8	56.2	56.9
Medium Trucks:	50.7	47.8	40.3	49.0	55.2	55.3
Heavy Trucks:	53.2	50.1	46.7	51.4	57.6	57.7
Vehicle Noise:	58.7	56.9	54.8	54.4	61.2	61.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	10	21	45	96
CNEL:	10	22	46	100

Sunday, July 17, 2022

APPENDIX 10.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS

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14755 - Calhoun Street/Avenue 42

CadnaA Noise Prediction Model: 14744-02_Operation.cna
Date: 01.08.22
Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Reference Time Day (min)	**960.00**
Reference Time Night (min)	**480.00**
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	34.9	31.4	38.3	0.0	0.0	0.0		x	Total	5.00	a	6573321.21	2211867.23	5.00
R2		R2	41.8	38.5	45.3	0.0	0.0	0.0		x	Total	5.00	a	6574322.84	2211779.06	5.00
R3		R3	45.6	42.4	49.2	0.0	0.0	0.0		x	Total	5.00	a	6575380.05	2211768.32	5.00
R4		R4	48.6	45.5	52.3	0.0	0.0	0.0		x	Total	5.00	a	6575742.13	2210869.76	5.00
R5		R5	47.7	44.4	51.2	0.0	0.0	0.0		x	Total	5.00	a	6575458.52	2210675.30	5.00
R6		R6	41.4	37.8	44.7	0.0	0.0	0.0		x	Total	5.00	a	6574427.01	2210412.30	5.00
R7		R7	39.4	35.8	42.7	0.0	0.0	0.0		x	Total	5.00	a	6574434.60	2210162.53	5.00
R8		R8	34.3	30.8	37.7	0.0	0.0	0.0		x	Total	5.00	a	6573150.49	2211753.71	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
AC001		AC001	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575643.81	2211628.08	3.00
AC002		AC002	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575618.11	2211630.17	3.00
AC003		AC003	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575600.06	2211630.17	3.00
AC004		AC004	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575583.39	2211629.47	3.00
AC005		AC005	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575566.72	2211629.47	3.00
AC006		AC006	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575551.45	2211629.47	3.00
AC007		AC007	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575534.78	2211629.47	3.00
AC008		AC008	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575518.11	2211629.47	3.00
AC009		AC009	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575494.50	2211628.08	3.00
AC010		AC010	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575452.14	2211631.56	3.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
AC011		AC011	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575429.92	2211626.69	3.00
AC012		AC012	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575409.78	2211628.08	3.00
AC013		AC013	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575385.47	2211631.56	3.00
AC014		AC014	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575365.33	2211630.17	3.00
AC015		AC015	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575343.81	2211627.39	3.00
AC016		AC016	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575324.36	2211628.08	3.00
AC017		AC017	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575302.14	2211630.86	3.00
AC018		AC018	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574895.89	2211629.47	3.00
AC019		AC019	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574995.89	2211630.86	3.00
AC020		AC020	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574979.22	2211630.17	3.00
AC021		AC021	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574963.95	2211630.17	3.00
AC022		AC022	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574913.25	2211630.86	3.00
AC023		AC023	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574946.58	2211630.86	3.00
AC024		AC024	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574929.22	2211631.56	3.00
AC025		AC025	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575016.72	2211628.78	3.00
AC026		AC026	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574573.67	2211632.25	3.00
AC027		AC027	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574591.03	2211631.56	3.00
AC028		AC028	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574640.33	2211631.56	3.00
AC029		AC029	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574623.67	2211630.86	3.00
AC030		AC030	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574661.17	2211629.47	3.00
AC031		AC031	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574540.33	2211630.17	3.00
AC032		AC032	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574557.70	2211631.56	3.00
AC033		AC033	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574608.39	2211630.86	3.00
AC034		AC034	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574529.92	2211630.17	3.00
AC035		AC035	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574788.95	2211633.64	3.00
AC036		AC036	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574727.83	2211630.17	3.00
AC037		AC037	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574747.28	2211629.47	3.00
AC038		AC038	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574705.61	2211632.94	3.00
AC039		AC039	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574855.61	2211633.64	3.00
AC040		AC040	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574813.25	2211630.17	3.00
AC041		AC041	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574833.39	2211628.78	3.00
AC042		AC042	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574768.81	2211632.25	3.00
AC043		AC043	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574916.02	2211511.42	3.00
AC044		AC044	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574940.29	2211507.74	3.00
AC045		AC045	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574895.89	2211512.98	3.00
AC046		AC046	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575001.43	2211510.69	3.00
AC047		AC047	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574981.99	2211511.55	3.00
AC048		AC048	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575023.63	2211507.72	3.00
AC049		AC049	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574873.63	2211508.32	3.00
AC050		AC050	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574960.44	2211508.96	3.00
AC051		AC051	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575272.70	2211509.60	3.00
AC052		AC052	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575187.29	2211510.34	3.00
AC053		AC053	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575231.71	2211507.87	3.00
AC054		AC054	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575294.90	2211506.63	3.00
AC055		AC055	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575211.56	2211506.66	3.00
AC056		AC056	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575253.26	2211510.46	3.00
AC057		AC057	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575167.16	2211511.90	3.00
AC058		AC058	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575144.90	2211507.23	3.00
AC059		AC059	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574468.51	2211119.85	3.00
AC060		AC060	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574467.28	2211056.66	3.00
AC061		AC061	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574470.25	2211078.86	3.00
AC062		AC062	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574467.28	2211140.00	3.00
AC063		AC063	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574467.84	2211206.66	3.00
AC064		AC064	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574472.52	2211184.40	3.00
AC065		AC065	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574470.96	2211164.27	3.00
AC066		AC066	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574471.10	2211098.30	3.00
AC067		AC067	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575272.97	2211626.69	3.00
AC068		AC068	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575252.14	2211628.78	3.00
AC069		AC069	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575235.47	2211628.08	3.00
AC070		AC070	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575220.20	2211628.08	3.00
AC071		AC071	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575202.83	2211628.78	3.00
AC072		AC072	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575185.47	2211629.47	3.00
AC073		AC073	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575169.50	2211628.78	3.00
AC074		AC074	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575152.14	2211627.39	3.00
AC075		AC075	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574709.52	2211508.20	3.00
AC076		AC076	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574724.80	2211508.20	3.00
AC077		AC077	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574741.46	2211508.90	3.00
AC078		AC078	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574762.30	2211506.82	3.00
AC079		AC079	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574692.16	2211508.90	3.00
AC080		AC080	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574646.85	2211509.42	3.00
AC081		AC081	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574669.59	2211510.37	3.00
AC082		AC082	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574632.87	2211507.51	3.00
AC083		AC083	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574637.69	2211447.74	3.00
AC084		AC084	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574670.51	2211448.00	3.00
AC085		AC085	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574718.16	2211448.52	3.00
AC086		AC086	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574744.73	2211449.30	3.00
AC087		AC087	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574809.57	2211449.30	3.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
AC088		AC088	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574869.47	2211447.22	3.00
AC089		AC089	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574887.69	2211448.00	3.00
AC090		AC090	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574952.02	2211447.74	3.00
AC091		AC091	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574967.12	2211447.74	3.00
AC092		AC092	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575194.73	2211444.10	3.00
AC093		AC093	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575211.13	2211444.88	3.00
AC094		AC094	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575276.76	2211443.83	3.00
AC095		AC095	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575291.08	2211444.62	3.00
AC096		AC096	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575350.45	2211444.62	3.00
AC097		AC097	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575417.12	2211445.14	3.00
AC098		AC098	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575432.75	2211447.74	3.00
AC099		AC099	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575488.48	2211448.26	3.00
AC100		AC100	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575522.85	2211448.78	3.00
AC101		AC101	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575578.58	2211449.04	3.00
AC102		AC102	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575617.12	2211448.26	3.00
AC103		AC103	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575615.56	2211508.16	3.00
AC104		AC104	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575595.51	2211512.58	3.00
AC105		AC105	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575574.41	2211512.85	3.00
AC106		AC106	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575552.28	2211508.94	3.00
AC107		AC107	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575520.51	2211508.16	3.00
AC108		AC108	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575504.10	2211509.98	3.00
AC109		AC109	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575488.48	2211509.98	3.00
AC110		AC110	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575466.86	2211508.42	3.00
AC111		AC111	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575444.47	2211508.94	3.00
AC112		AC112	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575429.10	2211510.50	3.00
AC113		AC113	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575412.95	2211510.76	3.00
AC114		AC114	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575390.56	2211508.94	3.00
AC115		AC115	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574593.78	2211290.78	3.00
AC116		AC116	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574596.93	2211177.27	3.00
AC117		AC117	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574594.78	2211236.88	3.00
AC118		AC118	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574596.02	2211268.42	3.00
AC119		AC119	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574596.06	2211252.27	3.00
AC120		AC120	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574594.68	2211214.48	3.00
AC121		AC121	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574596.64	2211192.90	3.00
AC122		AC122	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574595.41	2211160.84	3.00
AC123		AC123	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574591.30	2211533.34	3.00
AC124		AC124	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574587.13	2211511.47	3.00
AC125		AC125	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574587.13	2211489.94	3.00
AC126		AC126	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574591.30	2211468.76	3.00
AC127		AC127	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574594.42	2211324.49	3.00
AC128		AC128	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574590.26	2211367.19	3.00
AC129		AC129	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574590.26	2211345.67	3.00
AC130		AC130	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574635.05	2211370.32	3.00
AC131		AC131	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574666.65	2211370.84	3.00
AC132		AC132	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574716.65	2211369.80	3.00
AC133		AC133	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574753.10	2211369.28	3.00
AC134		AC134	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574796.33	2211369.28	3.00
AC135		AC135	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574635.40	2211277.09	3.00
AC136		AC136	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574636.44	2211252.61	3.00
AC137		AC137	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574637.48	2211158.86	3.00
AC138		AC138	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574669.77	2211159.38	3.00
AC139		AC139	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574718.21	2211159.90	3.00
AC140		AC140	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574744.25	2211159.38	3.00
AC141		AC141	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574809.35	2211159.38	3.00
AC142		AC142	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574900.50	2211157.30	3.00
AC143		AC143	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574955.19	2211156.78	3.00
AC144		AC144	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574979.67	2211156.26	3.00
AC145		AC145	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575020.81	2211156.26	3.00
AC146		AC146	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575018.73	2211249.49	3.00
AC147		AC147	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574980.19	2211252.09	3.00
AC148		AC148	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574945.29	2211249.49	3.00
AC149		AC149	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574910.92	2211249.49	3.00
AC150		AC150	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574910.92	2211280.22	3.00
AC151		AC151	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574954.67	2211280.22	3.00
AC152		AC152	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574993.73	2211281.78	3.00
AC153		AC153	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574992.17	2211375.01	3.00
AC154		AC154	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574951.54	2211376.05	3.00
AC155		AC155	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574910.92	2211375.01	3.00
AC156		AC156	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575060.40	2211356.26	3.00
AC157		AC157	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575108.83	2211356.26	3.00
AC158		AC158	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575177.06	2211375.01	3.00
AC159		AC159	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575219.25	2211375.01	3.00
AC160		AC160	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575259.35	2211375.53	3.00
AC161		AC161	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575258.31	2211280.22	3.00
AC162		AC162	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575219.25	2211279.69	3.00
AC163		AC163	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575179.15	2211280.74	3.00
AC164		AC164	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575152.06	2211251.05	3.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
AC165		AC165	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575189.56	2211250.01	3.00
AC166		AC166	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575229.67	2211252.09	3.00
AC167		AC167	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575258.31	2211251.57	3.00
AC168		AC168	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575261.44	2211157.30	3.00
AC169		AC169	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575228.63	2211157.82	3.00
AC170		AC170	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575191.65	2211156.78	3.00
AC171		AC171	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575153.10	2211157.82	3.00
AC172		AC172	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575372.90	2211158.34	3.00
AC173		AC173	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575418.21	2211159.90	3.00
AC174		AC174	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575452.58	2211159.90	3.00
AC175		AC175	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575503.63	2211159.38	3.00
AC176		AC176	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575536.44	2211159.38	3.00
AC177		AC177	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575534.88	2211253.13	3.00
AC178		AC178	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575534.88	2211278.13	3.00
AC179		AC179	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575533.31	2211370.84	3.00
AC180		AC180	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575500.50	2211368.76	3.00
AC181		AC181	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575452.06	2211371.88	3.00
AC182		AC182	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575416.65	2211370.32	3.00
AC183		AC183	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575373.94	2211370.84	3.00
AC184		AC184	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575577.58	2211372.40	3.00
AC185		AC185	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575579.15	2211334.38	3.00
AC186		AC186	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575579.67	2211305.74	3.00
AC187		AC187	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575580.71	2211266.15	3.00
AC188		AC188	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575691.13	2211366.15	3.00
AC189		AC189	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575689.04	2211336.47	3.00
AC190		AC190	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575691.65	2211294.28	3.00
AC191		AC191	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575690.08	2211265.63	3.00
AC192		AC192	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575690.60	2211225.53	3.00
AC193		AC193	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575691.13	2211189.07	3.00
AC194		AC194	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575575.50	2211232.30	3.00
AC195		AC195	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575575.50	2211201.57	3.00
AC196		AC196	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575574.98	2211152.09	3.00
AC197		AC197	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575576.54	2211122.40	3.00
AC198		AC198	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575691.13	2211153.65	3.00
AC199		AC199	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575691.65	2211117.19	3.00
AC200		AC200	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575598.42	2211082.82	3.00
AC201		AC201	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575598.42	2211052.61	3.00
AC202		AC202	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575693.73	2211079.69	3.00
AC203		AC203	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575692.69	2211048.44	3.00
AC204		AC204	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575692.17	2211012.51	3.00
AC205		AC205	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575601.54	2211017.19	3.00
AC206		AC206	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575601.02	2210979.17	3.00
AC207		AC207	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575692.17	2210974.49	3.00
AC208		AC208	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575692.17	2210948.44	3.00
AC209		AC209	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575599.98	2210947.92	3.00
AC210		AC210	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575598.42	2210904.69	3.00
AC211		AC211	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575599.98	2210864.07	3.00
AC212		AC212	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575693.21	2210906.78	3.00
AC213		AC213	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575692.17	2210861.99	3.00
AC214		AC214	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575676.54	2210830.74	3.00
AC215		AC215	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575648.94	2210829.69	3.00
AC216		AC216	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575610.92	2210829.17	3.00
AC217		AC217	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575575.50	2210843.76	3.00
AC218		AC218	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575543.73	2210843.76	3.00
AC219		AC219	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575504.67	2210844.80	3.00
AC220		AC220	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575471.85	2210843.76	3.00
AC221		AC221	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575436.44	2210839.07	3.00
AC222		AC222	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575390.08	2210839.07	3.00
AC223		AC223	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575361.44	2210839.07	3.00
AC224		AC224	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575321.85	2210839.07	3.00
AC225		AC225	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575494.77	2210942.19	3.00
AC226		AC226	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575455.19	2210942.19	3.00
AC227		AC227	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575423.42	2210941.67	3.00
AC228		AC228	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575389.56	2210946.36	3.00
AC229		AC229	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575351.54	2210945.84	3.00
AC230		AC230	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575321.85	2210945.32	3.00
AC231		AC231	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575313.52	2211054.17	3.00
AC232		AC232	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575348.42	2211055.22	3.00
AC233		AC233	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575387.48	2211055.74	3.00
AC234		AC234	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575416.65	2211056.26	3.00
AC235		AC235	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575456.23	2211057.30	3.00
AC236		AC236	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575670.64	2210747.79	3.00
AC237		AC237	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575639.39	2210748.49	3.00
AC238		AC238	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575601.19	2210749.18	3.00
AC239		AC239	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575551.89	2210747.79	3.00
AC240		AC240	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575520.64	2210749.18	3.00
AC241		AC241	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575472.03	2210749.88	3.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
AC242		AC242	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575441.47	2210749.88	3.00
AC243		AC243	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575390.08	2210749.18	3.00
AC244		AC244	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575362.31	2210751.27	3.00
AC245		AC245	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575324.11	2210749.88	3.00
AC246		AC246	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575290.78	2210750.57	3.00
AC247		AC247	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575251.19	2210749.18	3.00
AC248		AC248	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575220.64	2210749.18	3.00
AC249		AC249	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575170.64	2210748.49	3.00
AC250		AC250	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575172.72	2210844.32	3.00
AC251		AC251	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575206.75	2210846.40	3.00
AC252		AC252	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575253.28	2210843.63	3.00
AC253		AC253	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575283.14	2210845.02	3.00
AC254		AC254	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575284.53	2210944.32	3.00
AC255		AC255	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575252.58	2210942.24	3.00
AC256		AC256	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575214.39	2210942.24	3.00
AC257		AC257	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575176.89	2210941.54	3.00
AC258		AC258	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575147.03	2210940.85	3.00
AC259		AC259	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575276.89	2211054.74	3.00
AC260		AC260	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575245.64	2211057.52	3.00
AC261		AC261	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575212.31	2211056.82	3.00
AC262		AC262	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575178.97	2211058.21	3.00
AC263		AC263	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575144.25	2211058.21	3.00
AC264		AC264	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575017.17	2211056.82	3.00
AC265		AC265	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574990.08	2211056.82	3.00
AC266		AC266	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574951.89	2211055.43	3.00
AC267		AC267	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574923.42	2211056.82	3.00
AC268		AC268	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574885.92	2211056.82	3.00
AC269		AC269	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574854.67	2211055.43	3.00
AC270		AC270	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574816.47	2211056.13	3.00
AC271		AC271	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574785.22	2211054.04	3.00
AC272		AC272	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575028.28	2210942.24	3.00
AC273		AC273	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574989.39	2210942.24	3.00
AC274		AC274	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574958.14	2210940.15	3.00
AC275		AC275	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574922.72	2210945.02	3.00
AC276		AC276	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574885.92	2210945.02	3.00
AC277		AC277	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574856.06	2210944.32	3.00
AC278		AC278	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574820.64	2210944.32	3.00
AC279		AC279	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574783.83	2210940.85	3.00
AC280		AC280	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574753.97	2210942.93	3.00
AC281		AC281	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575020.64	2210838.77	3.00
AC282		AC282	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574993.56	2210838.07	3.00
AC283		AC283	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574953.97	2210839.46	3.00
AC284		AC284	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574917.86	2210844.32	3.00
AC285		AC285	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574888.00	2210845.02	3.00
AC286		AC286	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574847.72	2210846.40	3.00
AC287		AC287	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574804.67	2210844.32	3.00
AC288		AC288	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574770.64	2210842.24	3.00
AC289		AC289	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6575019.94	2210747.10	3.00
AC290		AC290	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574980.36	2210746.40	3.00
AC291		AC291	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574951.19	2210746.40	3.00
AC292		AC292	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574910.92	2210751.27	3.00
AC293		AC293	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574873.42	2210751.27	3.00
AC294		AC294	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574839.39	2210752.65	3.00
AC295		AC295	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574801.89	2210751.27	3.00
AC296		AC296	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574770.64	2210750.57	3.00
AC297		AC297	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574733.83	2210751.27	3.00
AC298		AC298	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574684.53	2210749.88	3.00
AC299		AC299	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574658.14	2210751.96	3.00
AC300		AC300	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574732.44	2210841.54	3.00
AC301		AC301	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574706.06	2210840.85	3.00
AC302		AC302	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574667.86	2210840.85	3.00
AC303		AC303	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574627.58	2210841.54	3.00
AC304		AC304	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574714.39	2210941.54	3.00
AC305		AC305	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574683.14	2210941.54	3.00
AC306		AC306	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574598.42	2210770.02	3.00
AC307		AC307	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574594.25	2210790.85	3.00
AC308		AC308	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574594.25	2210811.68	3.00
AC309		AC309	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574598.42	2210834.60	3.00
AC310		AC310	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574476.19	2210763.77	3.00
AC311		AC311	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574474.81	2210780.43	3.00
AC312		AC312	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574476.89	2210794.32	3.00
AC313		AC313	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574476.89	2210812.38	3.00
AC314		AC314	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574478.28	2210828.35	3.00
AC315		AC315	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574472.72	2210947.10	3.00
AC316		AC316	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574475.50	2210961.68	3.00
AC317		AC317	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574474.81	2210978.35	3.00
AC318		AC318	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574472.72	2210995.02	3.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
AC319		AC319	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574474.81	2211010.99	3.00
AC320		AC320	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574476.89	2211032.52	3.00
AC321		AC321	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574589.39	2210941.54	3.00
AC322		AC322	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574595.64	2210961.68	3.00
AC323		AC323	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574594.25	2210984.60	3.00
AC324		AC324	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574593.56	2211005.43	3.00
AC325		AC325	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574591.47	2211026.96	3.00
AC326		AC326	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574597.72	2211048.49	3.00
AC327		AC327	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574474.24	2211256.77	3.00
AC328		AC328	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574472.85	2211274.13	3.00
AC329		AC329	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574472.16	2211289.41	3.00
AC330		AC330	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574471.46	2211305.38	3.00
AC331		AC331	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574471.46	2211322.39	3.00
AC332		AC332	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574471.12	2211339.41	3.00
AC333		AC333	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574472.85	2211355.38	3.00
AC334		AC334	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574474.24	2211377.60	3.00
AC335		AC335	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574471.54	2211552.43	3.00
AC336		AC336	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574470.37	2211567.68	3.00
AC337		AC337	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574472.91	2211486.47	3.00
AC338		AC338	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574472.73	2211536.48	3.00
AC339		AC339	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574473.26	2211519.48	3.00
AC340		AC340	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574474.14	2211502.48	3.00
AC341		AC341	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	g	6574472.21	2211464.21	3.00
Pool01		Pool01	94.6	94.6	94.6	Lw	94.6		900.00	0.00	270.00	5.00	g	6575082.89	2211283.57	5.00
Pool02		Pool02	94.6	94.6	94.6	Lw	94.6		900.00	0.00	270.00	5.00	g	6574694.87	2211024.02	5.00
Pool03		Pool03	94.6	94.6	94.6	Lw	94.6		900.00	0.00	270.00	5.00	g	6575489.14	2211037.91	5.00
Pool04		Pool04	94.6	94.6	94.6	Lw	94.6		900.00	0.00	270.00	5.00	g	6575082.89	2211264.47	5.00
Out01		Out01	91.5	91.5	91.5	Lw	91.5		900.00	0.00	270.00	5.00	g	6575086.36	2211061.34	5.00
Out02		Out02	91.5	91.5	91.5	Lw	91.5		900.00	0.00	270.00	5.00	g	6575088.96	2210959.78	5.00

XC13N

ELITE® Series
R-410A - 60 Hz

RESIDENTIAL
PRODUCT SPECIFICATIONS

Bulletin No. 210839
January 2021
Supersedes October 2020

ELITE® SERIES

SEER up to 16.00
1.5 to 5 Tons
Cooling Capacity - 17,500 to 59,000 Btuh

MODEL NUMBER IDENTIFICATION

X C 13 N 024 - 230 - 2

- **Refrigerant**: X = R-410A
- **Unit Type**: C = Air Conditioner
- **Nominal SEER**: 13
- **Regional Standards**: N = North Region
- **Nominal Cooling Capacity**: 024
  - 018 = 1.5 tons
  - 024 = 2 tons
  - 030 = 2.5 tons
  - 036 = 3 tons
  - 042 = 3.5 tons
  - 048 = 4 tons
  - 060 = 5 tons
- **Voltage**: 230 = 208/230V-1phase-60Hz
- **Minor Revision Number**: 2

FEATURE HIGHLIGHTS

1. Condenser Fan
2. Copper Tube/Enhanced Fin Coil
3. High Pressure Switch
4. High Capacity Liquid Line Drier
5. Scroll Compressor
6. Heavy Gauge Steel Cabinet
7. SmartHinge™ Louvered Coil Protection
8. Refrigerant Line Access

CONTENTS

APPROVALS AND WARRANTY

APPROVALS

- AHRI Certified to AHRI Standard 210/240
- For AHRI Certified system match-ups and expanded ratings, visit www.LennoxPros.com
- Sound rated in Lennox reverberant sound test room in accordance with test conditions included in AHRI Standard 270-2008
- Tested in the Lennox Research Laboratory environmental test room
- Rated according to U.S. Department of Energy (DOE) test procedures
- Region specific models meet the minimum efficiency requirements for U.S. DOE Federal Regional Standards in that area
- Air conditioners and components within bonded for grounding to meet safety standards for servicing required by ETL and CEC
- Units are ETL certified for the U.S. and Canada
- ISO 9001 Registered Manufacturing Quality System

WARRANTY

- Compressor:
  - Limited ten years in residential installations
  - Limited five years in non-residential installations
- All other covered components:
  - Limited five years in residential installations
  - Limited one year in non-residential installations

NOTE - Refer to Lennox Equipment Limited Warranty certificate included with unit for specific details.

FEATURES

APPLICATIONS

- 1.5 through 5 tons
- Single phase power supply
- Sound levels as low as 74 dBA
- Vertical air discharge
- Matching add-on furnace indoor coils or air handlers provide a wide range of cooling capacities and applications. See AHRI System Matches
- See Indoor Coils and Air Handlers tab sections for data
- Shipped completely factory assembled, piped, and wired
- Each unit is test operated at the factory ensuring proper operation

NOTE - Installer must set air conditioner, connect refrigerant lines, and make electrical connections to complete job.

REFRIGERATION SYSTEM

R-410A Refrigerant

- Non-chlorine, ozone friendly
- Unit is factory pre-charged

NOTE - Total system refrigerant charge is dependent on outdoor unit size, indoor unit size and refrigerant line length.

NOTE - Refer to the unit-mounted charging sticker to determine correct amount of charge required.

❶ Condenser Fan

- Direct drive fan
- Vertical air discharge
- Sleeve bearings
- Inherently protected
- Enclosed fan motor
- Corrosion-resistant PVC (polyvinyl chloride) coated steel fan guard

❷ Copper Tube/Enhanced Fin Coil

- Lennox designed and fabricated coil
- Ripple-edged aluminum fins
- Copper tube construction
- Lanced fins for maximum fin surface exposure
- Fin collars grip tubing for maximum contact area
- Flared shoulder tubing connections
- Silver soldering construction
- Coil is factory tested under high pressure
- Entire coil is accessible for cleaning

❸ High Pressure Switch

- Shuts off unit if abnormal operating conditions cause the discharge pressure to rise above setting
- Automatic reset

Discharge Thermostat

- Factory installed on the discharge line of the compressor
- SPST, auto-reset
- Removes power from the compressor when discharge temperature exceeds the factory setting of 220ºF

❹ High Capacity Liquid Line Drier

- Factory installed in the liquid line
- Drier traps moisture or dirt
- 100% molecular-sieve, bead type, bi-flow drier

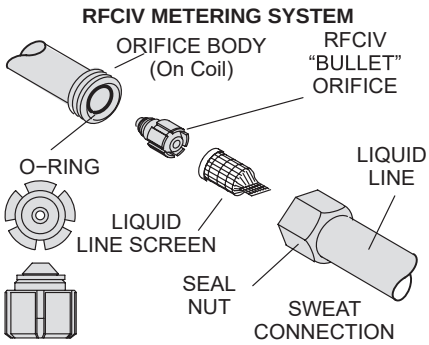
REFRIGERATION SYSTEM (continued)

Refrigerant Flow Control

- Units applicable to expansion valve systems or RFC systems when matched with specific indoor coils

RFCIV:

- Accurately meters refrigerant in system
- Refrigerant control is accomplished by exact sizing of refrigerant metering orifice
- The principle involves matching indoor coil with proper bore size of orifice in metering device



- Equalizes pressure shortly after compressor stops, unit starts unloaded, eliminating need for additional controls
- See RFC Orifice Usage Table on Page 10 for correct matches

Optional Accessories

Expansion Valve Kits

- Field installed on certain indoor units
- See TXV Usage Table
- Chatleff-style fittings

Freezestat

- Senses suction line temperature
- Cycles compressor off when suction line temperature falls below it's setpoint
- Opens at 29°F and closes at 58°F
- Installs on or near the discharge line of the evaporator or on the suction line

Loss of Charge Switch Kit

- Protects compressor from damage from low refrigerant charge conditions
- SPST
- Normally-closed
- Automatic reset

Refrigerant Line Kits

- Refrigerant lines are shipped refrigeration clean
- Lines are cleaned, dried, pressurized and sealed at factory
- Suction line fully insulated
- Lines are stubbed at both ends

NOTE - Not available for -060 models and must be field fabricated

COMPRESSOR

5 Scroll Compressor

- High efficiency with uniform suction flow
- Constant discharge flow, high volumetric efficiency and quiet operation
- Low gas pulses during compression reduces operational sound levels
- Compressor motor is internally protected from excessive current and temperature
- Muffler in discharge line reduces operating sound levels
- Compressor is installed in the unit on resilient rubber mounts for vibration free operation

Scroll Compressor Operation

- Two involute spiral scrolls matched together generate a series of crescent-shaped gas pockets between them
- During compression, one scroll remains stationary while the other scroll orbits around it
- Gas is drawn into the outer pocket, the pocket is sealed as the scroll rotates
- As the spiral movement continues, gas pockets are pushed to the center of the scrolls. Volume between the pockets is simultaneously reduced
- When the pocket reaches the center, gas is now at high pressure and is forced out of a port located in the center of the fixed scrolls
- During compression, several pockets are compressed simultaneously resulting in a smooth continuous compression cycle
- Continuous flank contact, maintained by centrifugal force, minimizes gas leakage and maximizes efficiency
- Compressor is tolerant to the effects of slugging and contaminants. If this occurs, scrolls separate, allowing liquid or contaminants to be worked toward the center and discharged

Optional Accessories

Compressor Crankcase Heater

- Protects against refrigerant migration that can occur during low ambient operation

Compressor Sound Cover

- Reinforced vinyl compressor cover
- 1-1/2 inch thick batt of fiberglass insulation
- Hook and loop fastening tape on all open edges

Compressor Hard Start Kit

- Single-phase units are equipped with a PSC compressor motor
- This type of motor normally doesn't need a potential relay and start capacitor
- For conditions such as low voltage kit may be required to increase the compressor starting torque

FEATURES

CONTROLS

Optional Accessories

iComfort® E30 Smart Wi-Fi Thermostat

- Wi-Fi enabled, electronic 7-day, universal, multi-stage, programmable, touchscreen thermostat
- 3 Heat/2 Cool
- Auto-changeover
- Controls dehumidification during cooling mode and humidification during heating mode

- Offers enhanced capabilities including humidification / dehumidification / dewpoint measurement and control, Humiditrol® control, and equipment maintenance reminders
- Easy to read 7 in. color touchscreen (measured diagonally)
- LCD display with backlight shows the current and set temperature, time, inside relative humidity, system status (operating mode and schedules) and outside temperature (optional outdoor sensor required)
- Smooth Setback Recovery starts system early to achieve setpoint at start of program period
- Compressor short-cycle protection (5 minutes)
- Up to four separate schedules are available plus Schedule IQ™
- One-Touch Away Mode - A quick and easy way to set the cooling and heating setpoints while away
- Smart Away™ - Uses geo-fencing technology to determine when the homeowner is within a predetermined distance from the home to operate the system when leaving, away and arriving
- Wi-Fi remote monitoring and adjustment through a home wireless network for desktop PCs, laptops and apps for smartphones or tablets
- Smart home automation compatible with Apple HomeKit™, Amazon Alexa®, Google Assistant and IFTTT
- Service Dashboard features online real-time monitoring of installed iComfort® thermostats
- High Definition Color Display with Subbase, Smart Hub Controller, wallplate (for retrofit installations) furnished for easy installation
- See the iComfort® E30 Smart Wi-Fi Thermostat Product Specifications bulletin for more information

Remote Outdoor Temperature Sensor

- Used with the iComfort® E30 Smart Thermostat.
- Outdoor sensor allows thermostat to display outdoor temperature.
- Sensor is auto-detected when connected to thermostat

NOTE - Sensor is required for high and low balance points option.

NOTE - Sensor is required for the Enhanced Dehumidification Accessory (EDA).

Thermostat

- Thermostat is not furnished with unit
- See Lennox Price Book for selection

Indoor Blower Off Delay Relay

- Delays the indoor blower-off time during the cooling cycle

Low Ambient Kit

- Air conditioners can operate down to 45°F outdoor air temperature without additional controls
- Allows unit to operate properly down to 30°F

NOTE - Crankcase heater and freezestat should be installed on compressors equipped with a low ambient kit.

NOTE - A compressor lock-out thermostat should be added to terminate compressor operation below recommended operation conditions.

Compressor Time-Off

- Kit prevents compressor short-cycling
- Allows time for suction and discharge pressure to equalize
- Permits compressor start-up in an unloaded condition
- Automatic reset
- Five minute delay between compressor shut-off and start-up

FEATURES

CABINET

6
- Heavy-gauge steel construction
- Pre-painted cabinet finish
- Control box is conveniently located with all controls factory wired
- Corner patch plate allows access to compressor components
- Drainage holes are provided in base section
- High density polyethylene unit support feet raise the unit off of the mounting surface, away from damaging moisture

PermaGuard™ Unit Base
- Durable zinc-coated base section resists rust and corrosion

7 SmartHinge™ Louvered Coil Protection
- Steel louvered panels provides complete coil protection
- Panels are hinged to allow easy cleaning and servicing of coils
- Panels may be completely removed
- Interlocking tabs and slots assure tight fit on cabinet

8 Refrigerant Line Connections, Electrical Inlets, Service Valves
- Sweat connection suction and liquid lines
- Located on corner of unit cabinet
- Fully serviceable brass service valves
- Suction valve can be fully shut off, while liquid valve may be front seated to manage refrigerant charge while servicing system
- Refrigerant line connections and field wiring inlets are located in one central area of cabinet for easy access
- See dimension drawing

SPECIFICATIONS

General Data	Model No.	North Region	XC13N018	XC13N024	XC13N030	XC13N036	XC13N042	XC13N048	XC13N060
		Nominal Tonnage	1.5	2	2.5	3	3.5	4	5
Connections (sweat)		Liquid line o.d. - in.	3/8	3/8	3/8	3/8	3/8	3/8	3/8
		Suction line o.d. - in.	3/4	3/4	3/4	3/4	7/8	7/8	7/8
[1] Refrigerant (R-410A) Furnished			4 lbs. 1 oz.	3 lbs. 14 oz.	5 lbs. 4 oz.	5 lbs. 10 oz.	6 lbs. 12 oz.	7 lbs. 12 oz.	9 lbs. 0 oz.
RFCIV Metering Orifice Size Furnished			0.051	0.057	0.059	0.072	0.076	0.082	0.092
Outdoor Coil	Net face area sq. ft.	Outer coil	11.33	11.33	13.22	13.22	21.00	18.67	16.33
		Inner coil	- - -	- - -	- - -	- - -	- - -	- - -	15.71
		Tube diameter - in.	5/16	5/16	5/16	5/16	5/16	5/16	5/16
		Number of rows	1	1	1	1	1	1	2
		Fins per inch	26	26	26	26	26	26	22
Outdoor Fan		Diameter - in.	18	18	18	18	22	22	22
		Number of blades	3	3	4	4	4	4	4
		Motor hp	1/10	1/10	1/5	1/5	1/4	1/4	1/4
		Cfm	2350	2350	2400	2400	3670	3670	3600
		Rpm	1075	1075	1075	1075	825	825	825
		Watts	165	165	185	185	295	295	285
Shipping Data - lbs. 1 package			150	150	161	164	240	232	249

ELECTRICAL DATA

		Line voltage data - 60 Hz - 1ph	208/230V	208/230V	208/230V	208/230V	208/230V	208/230V	208/230V
[2] Maximum overcurrent protection (MOCP) amps			20	25	25	35	40	50	60
[3] Minimum circuit ampacity (MCA)			12.4	14.7	17.1	20.4	25.7	32.0	34.6
Compressor		Rated load amps	9.4	11.2	12.8	15.4	19.2	24.2	26.3
		Locked rotor amps	56.6	60.8	67.8	83.8	123.9	100	125
		Power factor	0.98	0.98	0.98	0.99	0.99	0.99	0.99
Condenser Fan Motor		Full load amps	0.7	0.7	1.2	1.1	1.7	1.7	1.7
		Locked rotor amps	1.4	1.4	2.0	2.0	3.2	3.2	3.2

CONTROLS - ORDER SEPARATELY

iComfort® E30 Smart Wi-Fi Thermostat		20A65	•	•	•	•	•	•	•
Remote Outdoor Temperature Sensor		X2658	•	•	•	•	•	•	•

OPTIONAL ACCESSORIES - ORDER SEPARATELY

Compressor Crankcase Heater		93M04	•	•	•	•			
		93M05					•	•	•
Compressor Hard Start Kit	Copeland	10J42	•	•	•	•	•	•	•
	LG	88M91	•	•	•	•	•	•	•
Compressor Low Ambient Cut-Off Switch		45F08	•	•	•	•	•	•	•
Compressor Sound Cover		18J42	•	•	•	•	•	•	•
Compressor Time-Off Control		47J27	•	•	•	•	•	•	•
Freezestat	3/8 in. tubing	93G35	•	•	•	•	•	•	•
	5/8 in. tubing	50A93	•	•	•	•	•	•	•
Loss of Charge Switch Kit		84M23	•	•	•	•	•	•	•
Indoor Blower Off Delay Relay		58M81	•	•	•	•	•	•	•
[4] Low Ambient Kit (Fan Cycling)		34M72	•	•	•	•	•	•	•
Refrigerant Line Sets	L15-41-20, L15-41-30, L15-41-40, L15-41-50		•	•	•	•			
	L15-65-30, L15-65-40, L15-65-50						•	•	
	Field Fabricate								•

NOTE - Extremes of operating range are plus 10% and minus 5% of line voltage.

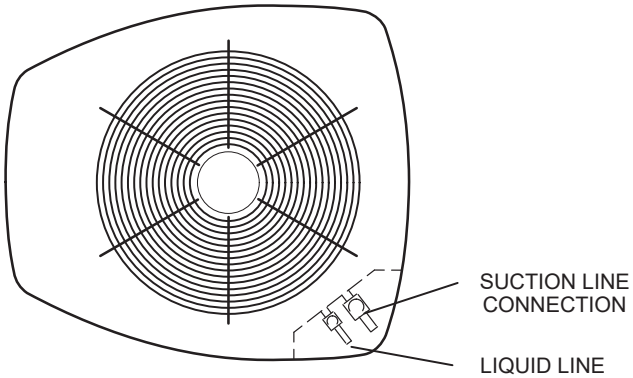
[1] Refrigerant charge sufficient for 15 ft. length of refrigerant lines.

[2] HACR type circuit breaker or fuse.

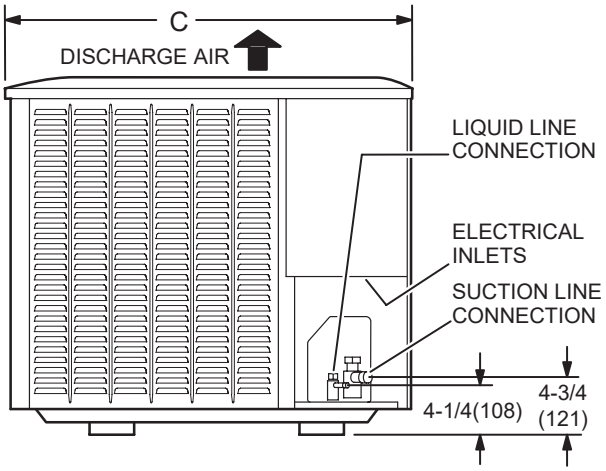
[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

[4] Crankcase Heater and Freezestat are recommended with Low Ambient Kit.

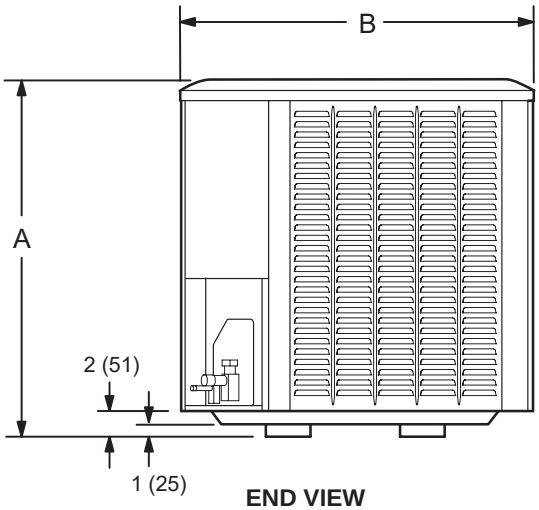
DIMENSIONS



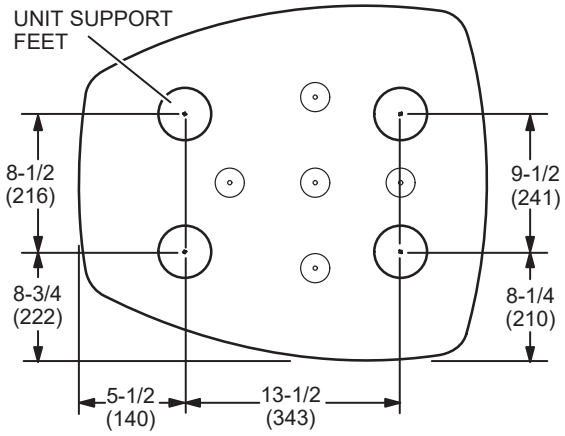
TOP VIEW



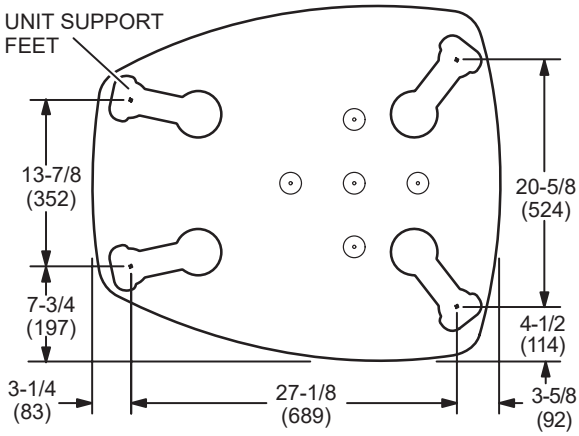
SIDE VIEW



END VIEW



018 TO 036 BASE SECTION
(Small Base)



042 TO 060 BASE SECTION
(Medium Base)

Model	A		B		C	
	in.	mm	in.	mm	in.	mm
018, 024	27	686	27	686	28	711
030, 036	31	787	27	686	28	711
042	39	991	30-1/2	775	35	889
048	35	889	30-1/2	775	35	889
060	31	787	30-1/2	775	35	889

SOUND DATA

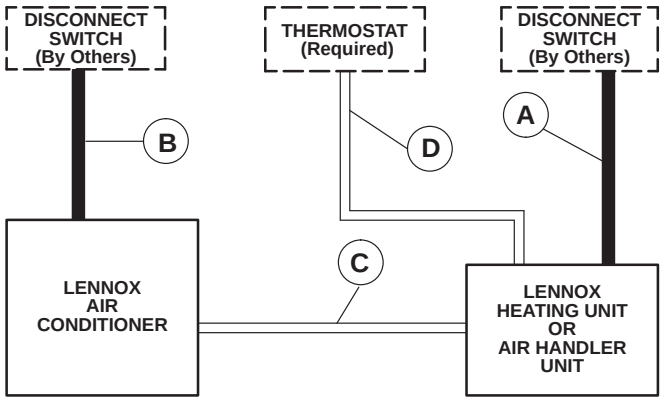
[1] Unit Model	Octave Band Sound Power Levels dBA, re 10^{-12} Watts Center Frequency - HZ							[1] Sound Rating Number (dBA)	[2] Estimated Sound Pressure Level at Distance From Unit (dBA at distance in ft.)				
	125	250	500	1000	2000	4000	8000		3	5	10	15	50
018	67.5	66.5	68.5	66.5	60.5	56	52	74	67	62	56	53	42
024	69.5	66	68.5	65.5	61	61.5	58.5	74	67	62	56	53	42
030	70.5	71	73.5	70.5	67.5	61.5	57.5	76	69	64	58	55	44
036	69.5	72.5	74.5	71.5	68.5	63.5	58.5	76	69	64	58	55	44
042	73.5	71.5	72.5	69.5	65.5	60.5	57.5	76	69	64	58	55	44
048	73.5	72.5	72.5	71.5	66.5	61.5	61.5	76	69	64	58	55	44
060	75	72.5	73.5	71	65.5	61	60	76	69	64	58	55	44

NOTE - the octave sound power data does not include tonal correction.

[1] Tested according to AHRI Standard 270-2008 test conditions.

[2] Estimated sound pressure level at distance based on AHRI Standard 275-2010 method for equipment located on the ground, roof, or on side of building wall with no adjacent reflective surface within 9.8 feet. Sound pressure levels will increase based on changes to assumptions. For other applications, refer to AHRI Standard 275.

FIELD WIRING



A - Two Wire Power (not furnished)

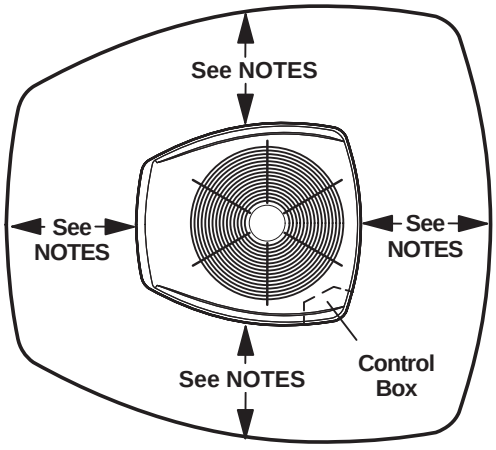
B - Two Power (not furnished). See Electrical Data

C - Four Wire Low Voltage (not furnished). 18 ga. minimum

D - Five Wire Low Voltage (not furnished). 18 ga. minimum

All wiring must conform to NEC or CEC and local electrical codes.

INSTALLATION CLEARANCES



NOTES:

Service clearance of 30 in. (762 mm) must be maintained on one of the sides adjacent to the control box.

Clearance to one of the other three sides must be 36 in. (914 mm)

Clearance to one of the remaining two sides may be 12 in. (305 mm) and the final side may be 6 in. (152 mm).

A clearance of 24 in. (610 mm) must be maintained between two units.

48 in. (1219 mm) clearance required on top of unit.

TXV/ORIFICE USAGE

Use this table for C35, CH23, CH35 and CR33 Field Installed TXV/Orifice Match-Ups

Outdoor Unit	Refrigerant Metering Orifice (RFC)		Thermal Expansion Valve (TXV)
	Order No.	Orifice Size	
018	**10W92**	0.050	**12J18**
024	**97M75**	0.057	**12J18**
030	**10W96**	0.059	**12J18**
036	**10W85**	0.072	**12J19**
042	**97M78**	0.076	**12J20**
048	**97M79**	0.082	**12J20**
060	**10M13**	0.090	**12J20**

CX35 and CHX35 coils and all Lennox air handlers are shipped with a factory installed TXV. In most cases, no change out of the valve is needed.

If a change out is required it will be listed in the "TXV SUBSTITUTIONS" table by size. The correct TXV must be ordered separately and field installed.

C35 and CH35 coils - Use the RFC orifice shipped with the outdoor unit or replace the factory installed RFC orifice with the expansion valve listed.

CR33 and CH23 coils - Use the RFC orifice shipped with the outdoor unit or use the expansion valve listed.

AHRI STANDARD 210/240

Cooling or heating capacities are net values, including the effects of blower motor heat, and do not include supplementary heat. Power input is the total power input to the compressor(s) and fan(s), plus any controls and other items required as part of the system for normal operation.

Units which do not have an indoor air-circulating blower furnished as part of the model, i.e., split system with indoor coil only, is established by subtracting from the total cooling capacity 1250 Btu/h per 1,000 cfm, and by adding the same amount to the heating capacity. Total power input for both heating and cooling is increased by 365 W per 1,000 cfm of indoor air circulated.

TXV SUBSTITUTION

A general guide for replacing the factory installed TXV if the indoor unit (coil/air handler) is larger or smaller than the outdoor unit.

Outdoor Unit		Indoor Unit		TXV Furnished	TXV Replacement
Size	Tons	Size	Tons		
018	1.5	30/36	2.5/3	**12J19**	**12J18**
018	1.5	36	3	**12J19**	**12J18**
018	1.5	42	3.5	**12J20**	**12J18**
018	1.5	48	4	**12J20**	**12J18**
018	1.5	49	4	**12J20**	**12J18**
018	1.5	50/60	4/5	**12J20**	**12J18**
018	1.5	51/61	4/5	**12J20**	**12J18**
018	1.5	60	5	**12J20**	**12J18**
024	2	42	3.5	**12J20**	**12J18**
024	2	48	4	**12J20**	**12J18**
024	2	49	4	**12J20**	**12J18**
024	2	50/60	5	**12J20**	**12J18**
024	2	51/61	5	**12J20**	**12J18**
024	2	60	5	**12J20**	**12J18**
030	2.5	42	3.5	**12J20**	**12J18**
030	2.5	43	3.5	**12J20**	**12J18**
030	2.5	48	4	**12J20**	**12J18**
030	2.5	49	4	**12J20**	**12J18**
036	3	24	2	**12J18**	**12J19**
036	3	30	2.5	**12J18**	**12J19**
042	3.5	24	2	**12J18**	**12J20**
042	3.5	30	2.5	**12J18**	**12J20**
042	3.5	30/36	3	**12J19**	**12J20**
042	3.5	36	3	**12J19**	**12J20**
048	4	30/36	2.5/3	**12J19**	**12J20**
048	4	36	3	**12J19**	**12J20**

TXV Ranges:

12J18 - 1.5 to 2.5 ton systems - Use on 2.5 ton (030) and lower systems.

12J19 - 3 ton systems - Use down to 2 ton (024) systems.

12J20 - 3.5 to 5 ton systems - Use down to 3 ton (036) systems.

REVISIONS

Sections	Description of Change
Electrical Data	Updated for 030, 036,042 models. RFC Orifice size updated for 030 model.
Specifications	Refrigerant charge updated for 030, 036,042 models.

Visit us at www.lennox.com
For the latest technical information, www.LennoxPros.com
Contact us at 1-800-4-LENNOX

NOTE - Due to Lennox' ongoing commitment to quality, Specifications, Ratings and Dimensions subject to change without notice and without incurring liability.
Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury.
Installation and service must be performed by a qualified installer and servicing agency

APPENDIX 11.1:

CADNAA CONSTRUCTION NOISE MODEL INPUTS

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14755 - Calhoun Street/Avenue 42

CadnaA Noise Prediction Model: 14744-02_Construction_P1.cna
Date: 01.08.22
Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Reference Time Day (min)	**960.00**
Reference Time Night (min)	**480.00**
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	48.9	-51.1	45.9	0.0	0.0	0.0		x	Total	5.00	a	6573120.69	2211742.23	5.00
R2		R2	58.5	-41.5	55.5	0.0	0.0	0.0		x	Total	5.00	a	6574383.95	2211775.59	5.00
R3		R3	60.6	-39.4	57.6	0.0	0.0	0.0		x	Total	5.00	a	6575409.35	2211759.64	5.00
R4		R4	67.5	-32.5	64.5	0.0	0.0	0.0		x	Total	5.00	a	6575730.19	2210819.85	5.00
R5		R5	67.9	-32.1	64.9	0.0	0.0	0.0		x	Total	5.00	a	6575346.84	2210732.01	5.00
R6		R6	56.9	-43.1	53.9	0.0	0.0	0.0		x	Total	5.00	a	6574394.20	2210521.67	5.00
R7		R7	54.1	-45.9	51.1	0.0	0.0	0.0		x	Total	5.00	a	6574422.79	2210220.86	5.00
R8		R8	47.8	-52.2	44.8	0.0	0.0	0.0		x	Total	5.00	a	6572885.73	2211701.62	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
CONSTRUCTION_ACTIVITY		CA01	116.6	16.6	16.6	66.0	-34.0	-34.0	PWL-Pt	116.6					8	a
CONSTRUCTION_ACTIVITY		CA02	0.0	-100.0	-100.0	-50.9	-150.9	-150.9	PWL-Pt	0					8	a

Name	Height			Coordinates			
	Begin		End	x	y	z	Ground
	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
CONSTRUCTION_ACTIVITY	8.00	a		6575735.14	2211651.04	8.00	0.00
				6575729.66	2210730.47	8.00	0.00
				6574393.36	2210735.84	8.00	0.00
				6574378.73	2211663.67	8.00	0.00

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
CONSTRUCTION_ACTIVITY	8.00	a			6574378.73	2211663.67	8.00	0.00
					6574394.36	2210480.26	8.00	0.00
					6574410.88	2210479.26	8.00	0.00
					6574408.35	2209870.89	8.00	0.00
					6574104.83	2210259.87	8.00	0.00
					6573795.68	2210639.03	8.00	0.00
					6573374.23	2211127.05	8.00	0.00
					6573015.79	2211518.73	8.00	0.00
					6572838.43	2211705.21	8.00	0.00
					6573104.78	2211702.52	8.00	0.00
					6573104.81	2211669.50	8.00	0.00
					6574356.53	2211663.77	8.00	0.00