Appendix L.1

Noise Study
Urban Crossroads, 2023

Travertine SPA
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Technical Appendices

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Travertine Specific Plan

NOISE IMPACT ANALYSIS

CITY OF LA QUINTA

PREPARED BY:

Bill Lawson, PE, INCE
blawson@urbanxroads.com
(949) 584-3148

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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
EA	Existing plus Ambient
EAC	Existing plus Ambient plus Cumulative
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GPA	General Plan Amendment
INCE	Institute of Noise Control Engineering
Leq	Equivalent continuous (average) sound level
Lmax	Maximum level measured over the time interval
Lmin	Minimum level measured over the time interval
mph	Miles per hour
PPV	Peak Particle Velocity
Project	Travertine Specific Plan
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 for the proposed Travertine Specific Plan development ("Project"). The Project site is generally located south of the hypothetical westerly extension of Avenue 60 and west of the hypothetical southerly extension of Madison Street in the City of La Quinta. The proposed mixed-use Project consists of approximately 758 single family detached residential homes, 442 duplex residential units, a 100-room resort hotel, and other resort/golf facilities located in Planning Area 11 (PA 11). PA 11 consists of 46.2 acres and includes the following land uses:

- Golf Practice (4-Holes) & Driving Range: 23.9 Acres (up to 1,000 sf of clubhouse area)
- Golf Academy: 4.7 Acres (up to 5,500 sf of indoor floor area)
- Banquet Facility & Restaurant: 4.6 Acres (up to 10,000 sf of indoor floor area)
- Slopes: 13.0 Acres (passive outdoor use)

This study has been prepared to satisfy applicable City of La Quinta noise standards and significance criteria based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

OPERATIONAL NOISE LEVELS

The Travertine Specific Plan is not expected to include any operational noise source levels beyond those typically associated with the planned residential, resort hotel and golf course land use in the Project study area. This includes people moving around the site, parking lot vehicle movements, air conditioning units, play areas, etc. and is generally considered as a noise-sensitive receiving land use. Therefore, no potential operational noise impacts for the planned residential, resort hotel and golf course land use are analyzed in the noise study. It is expected that the primary noise activity will be due to the Project-related off-site vehicle traffic on nearby roadways.

SUMMARY OF CEQA SIGNIFICANCE FINDINGS

The results of this Travertine Specific Plan 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
Off-Site Traffic	7	*Less Than Significant*	-
On-Site Traffic	8	*Less Than Significant*	-
Construction Noise	10	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

1 INTRODUCTION

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

1.1 SITE LOCATION

The proposed Travertine Specific Plan Project is generally located south of the hypothetical westerly extension of Avenue 60 and west of the hypothetical southerly extension of Madison Street in the City of La Quinta, as shown on Exhibit 1-A. Bureau of Land Management land is located adjacent to the Project's southern boundary, Martinez Mountain is located to the southwest, and existing residential homes are located north and east of the Project site.

1.2 PROJECT DESCRIPTION

The proposed mixed-use Project consists of approximately 758 single family detached residential homes, 442 duplex residential units, a 100-room resort hotel, and other resort/golf facilities located in Planning Area 11 (PA 11). PA 11 consists of 46.2 acres and includes the following land uses:

- Golf Practice (4-Holes) & Driving Range: 23.9 Acres (up to 1,000 sf of clubhouse area)
- Golf Academy: 4.7 Acres (up to 5,500 sf of indoor floor area)
- Banquet Facility & Restaurant: 4.6 Acres (up to 10,000 sf of indoor floor area)
- Slopes: 13.0 Acres (passive outdoor use)

The Travertine Project is proposed to be served by two access points: 1) the southerly extension of South Jefferson as a Modified Secondary, south of Avenue 58, and 2) the westerly extension of Avenue 62 as a Modified Secondary, west of Monroe Street. An emergency vehicle access (EVA) is provided via Madison Street, from the northerly boundary of the Project's Planning Area 18 to Avenue 60. Since emergency vehicle activities are exempt from the provisions of the City of La Quinta Noise Control Ordinance (9.100.210[E]) and due to the infrequent nature of this activity, the potential emergency vehicle noise level impacts are considered *less than significant*.

EXHIBIT 1-A: LOCATION MAP

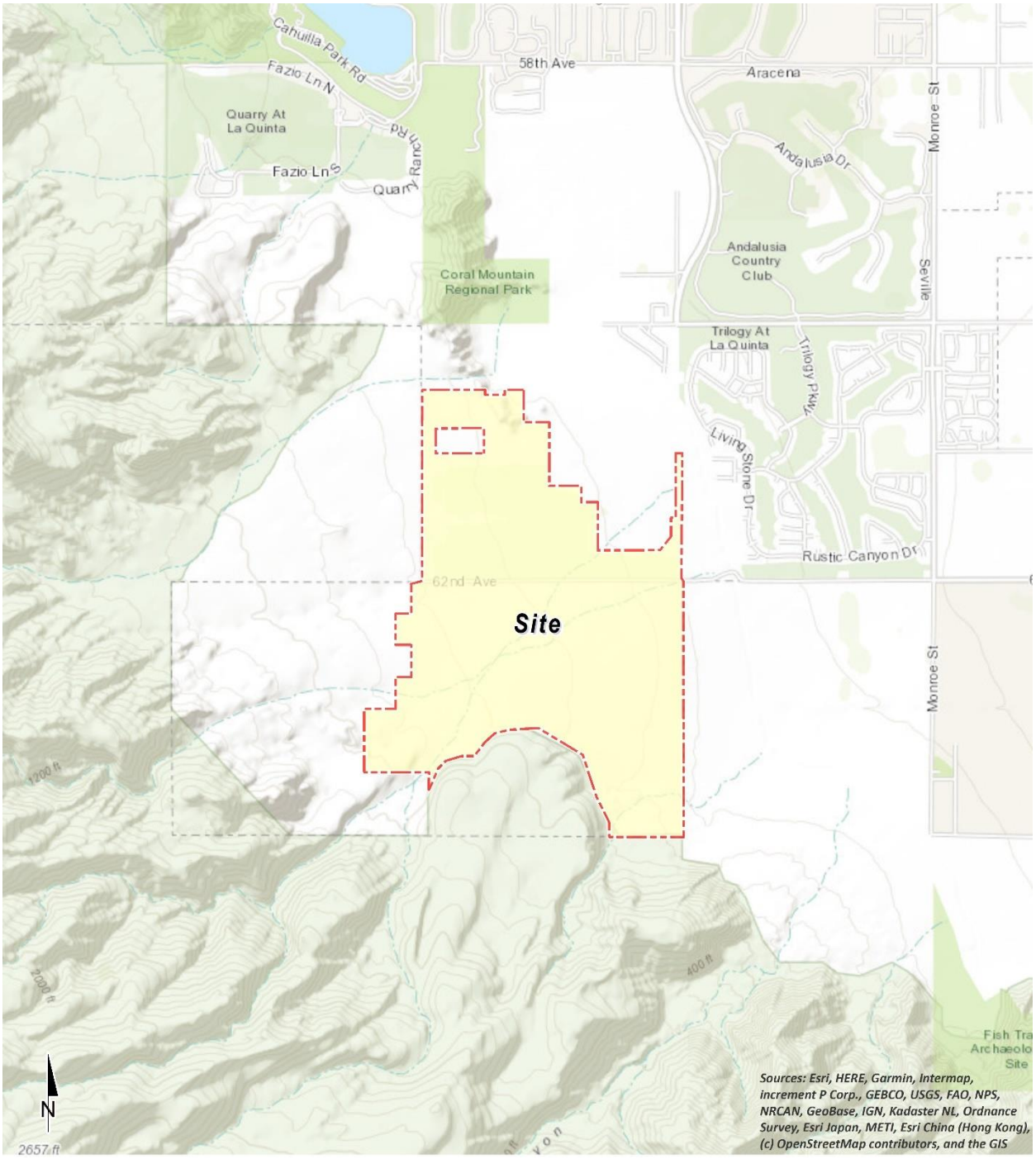


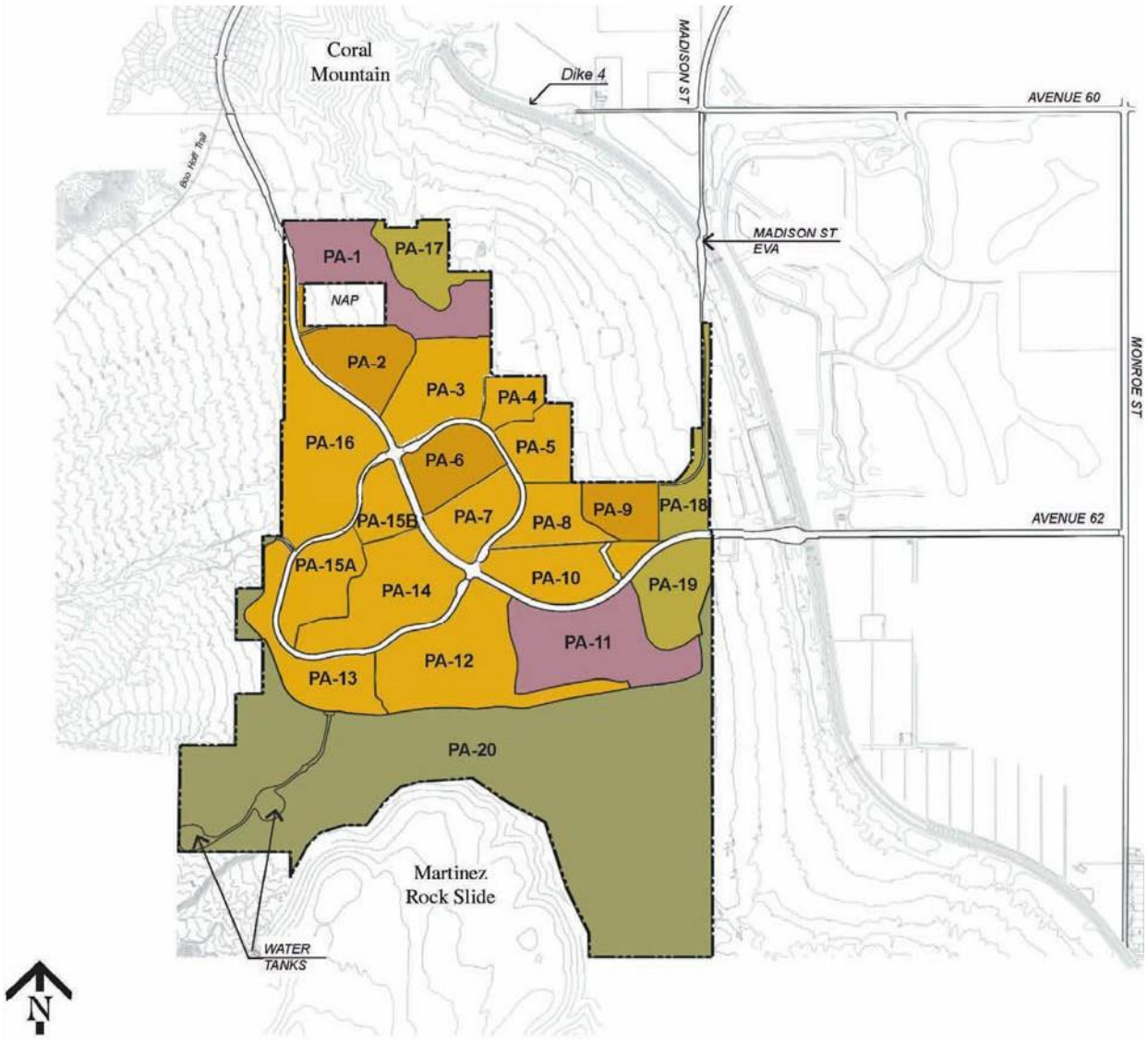
EXHIBIT 1-B: PRELIMINARY LAND USE PLAN

PHASE 1-A Constuction/Sales						
PA	Land Use	Acres	Density Range	Target Density	Target Units	Villas
10	Low Density Residential	25.6	1.5-4.5 du/ac	2.9	75	
11	Resort / Golf	46.2				
12	Low Density Residential	52.2	1.5-4.5 du/ac	2.0	107	
13	Low Density Residential	26.7	1.5-4.5 du/ac	1.8	48	
14	Low Density Residential	39.0	1.5-4.5 du/ac	1.7	65	
15-A	Low Density Residential	20.9	1.5-4.5 du/ac	2.1	44	
19	Open Space Recreation	23.1				
20	Open Space Natural	301.2				
	Phase 1-A Totals	**534.9**		**0.6**	**339**	

PHASE 1-B Constuction/Sales						
PA	Land Use	Acres	Density Range	Target Density	Target Units	Villas
5	Low Density Residential	16.2	1.5-4.5 du/ac	1.9	31	
7	Low Density Residential	18.7	1.5-4.5 du/ac	3.3	61	
8	Low Density Residential	16.9	1.5-4.5 du/ac	4.3	73	
9	Medium Density Residential	14.8	4.5-8.5 du/ac	5.0	74	
15-B	Low Density Residential	12.4	1.5-4.5 du/ac	2.1	26	
18	Open Space Recreation	14.7				
	Phase 1-B Totals	**93.7**		**2.8**	**265**	

PHASE 2 Constuction/Sales						
PA	Land Use	Acres	Density Range	Target Density	Target Units	Villas
4	Low Density Residential	9.6	1.5-4.5 du/ac	2.8	27	
6	Medium Density Residential	20.1	4.5-8.5 du/ac	8.1	163	
16	Low Density Residential	50.4	1.5-4.5 du/ac	2.3	116	
	Phase 2 Totals	**80.1**		**3.8**	**306**	

PHASE 3 Constuction/Sales						
PA	Land Use	Acres	Density Range	Target Density	Target Units	Villas
1	Resort / Spa	38.3				100
2	Medium Density Residential	25.9	4.5-8.5 du/ac	7.9	205	
3	Low Density Residential	29.4	1.5-4.5 du/ac	2.9	85	
17	Open Space Recreation	18.1				
	Phase 3 Totals	**111.7**		**2.6**	**290**	**100**



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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. (2) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 100 feet, which can cause serious discomfort. (3) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (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 (typically one hour) 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 sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The City of La Quinta 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. (2)

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. (4)

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. (2)

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 FHWA does not consider the planting of vegetation to be a noise abatement measure. (4)

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 up to 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 be high enough and long enough to block the path of the noise source. (4)

2.6 LAND USE COMPATIBILITY WITH NOISE

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

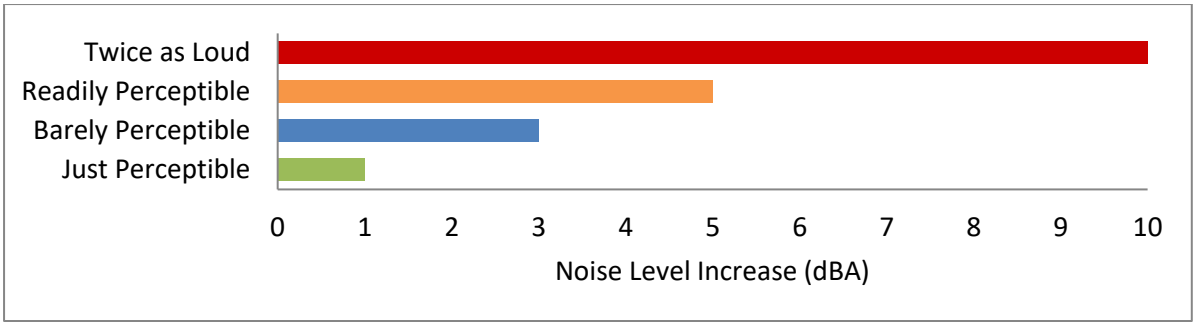
2.7 COMMUNITY RESPONSE TO NOISE

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

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

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (6) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (6) Despite this variability in behavior on an individual level, the population 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*. (4)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 EXPOSURE TO HIGH NOISE LEVELS

The Occupational Safety and Health Administration (OSHA) sets legal limits on noise exposure in the workplace. The permissible exposure limit (PEL) for a worker over an eight-hour day is 90 dBA. The OSHA standard uses a 5 dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half. The National Institute for Occupational Safety and Health (NIOSH) has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dBA for eight hours to minimize occupational noise induced hearing loss. NIOSH also recommends a 3 dBA exchange rate so that every increase by 3 dBA doubles the amount of the noise and halves the recommended amount of exposure time. (7)

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

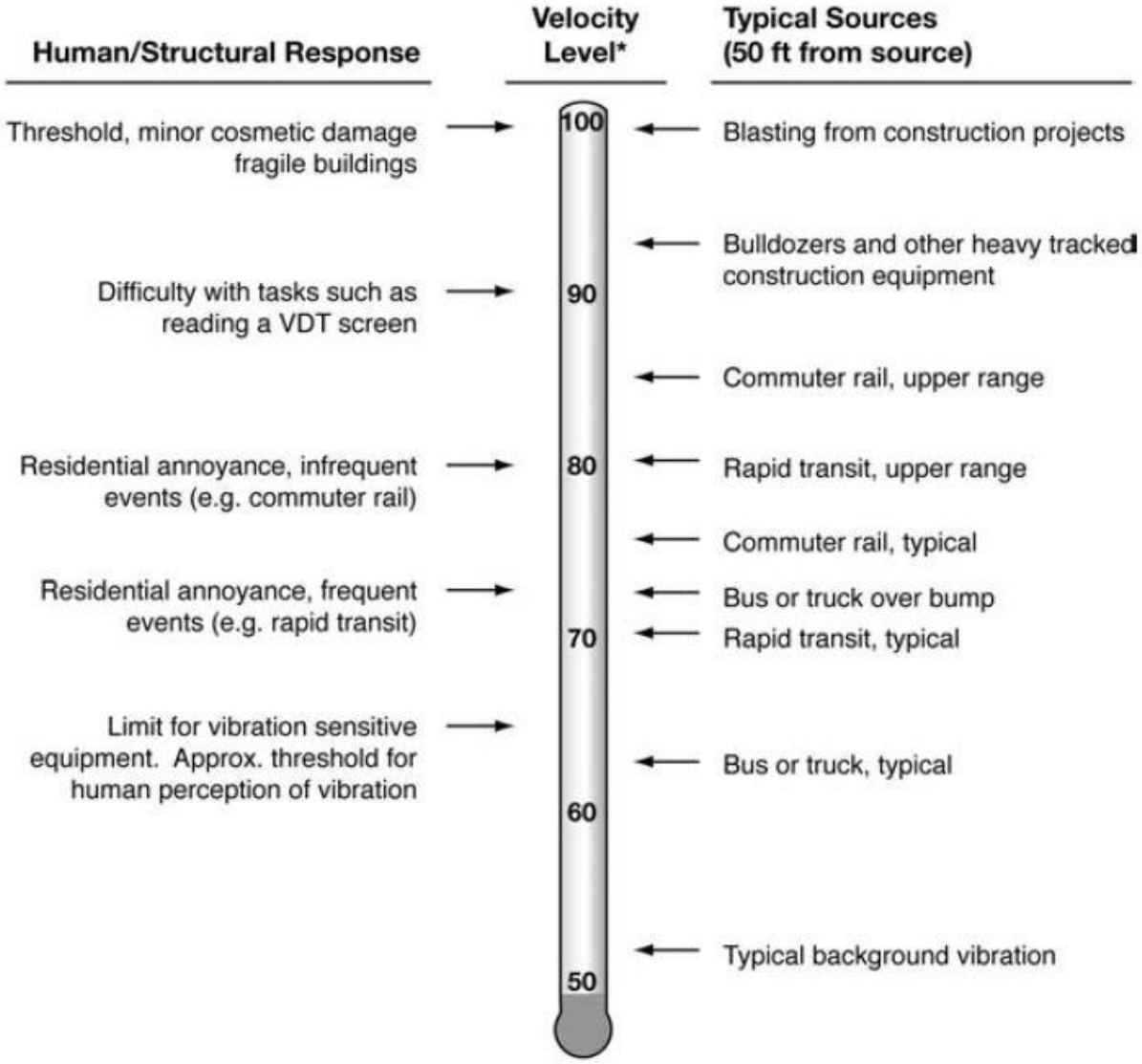
2.9 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment Manual* (8), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

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

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

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



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

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

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3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains 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). (9) 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 STANDARDS

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

3.3 CITY OF LA QUINTA GENERAL PLAN ENVIRONMENTAL HAZARDS ELEMENT

The City of La Quinta has adopted an Environmental Hazards Element (Chapter 4), Noise section, of the General Plan which *identifies areas where noise levels are expected to reach unacceptable levels, and provides policies and programs which will assure that noise levels do not negatively impact the community.* (10) The Noise Element specifies the maximum exterior and interior noise levels for new developments impacted by transportation noise sources such as arterial roads,

freeways, airports and railroads. To protect City residents from excessive noise, the Environmental Hazards Element contains the following goal related to the Project:

> *N-1* *A healthful noise environment which complements the City's residential and resort character.*

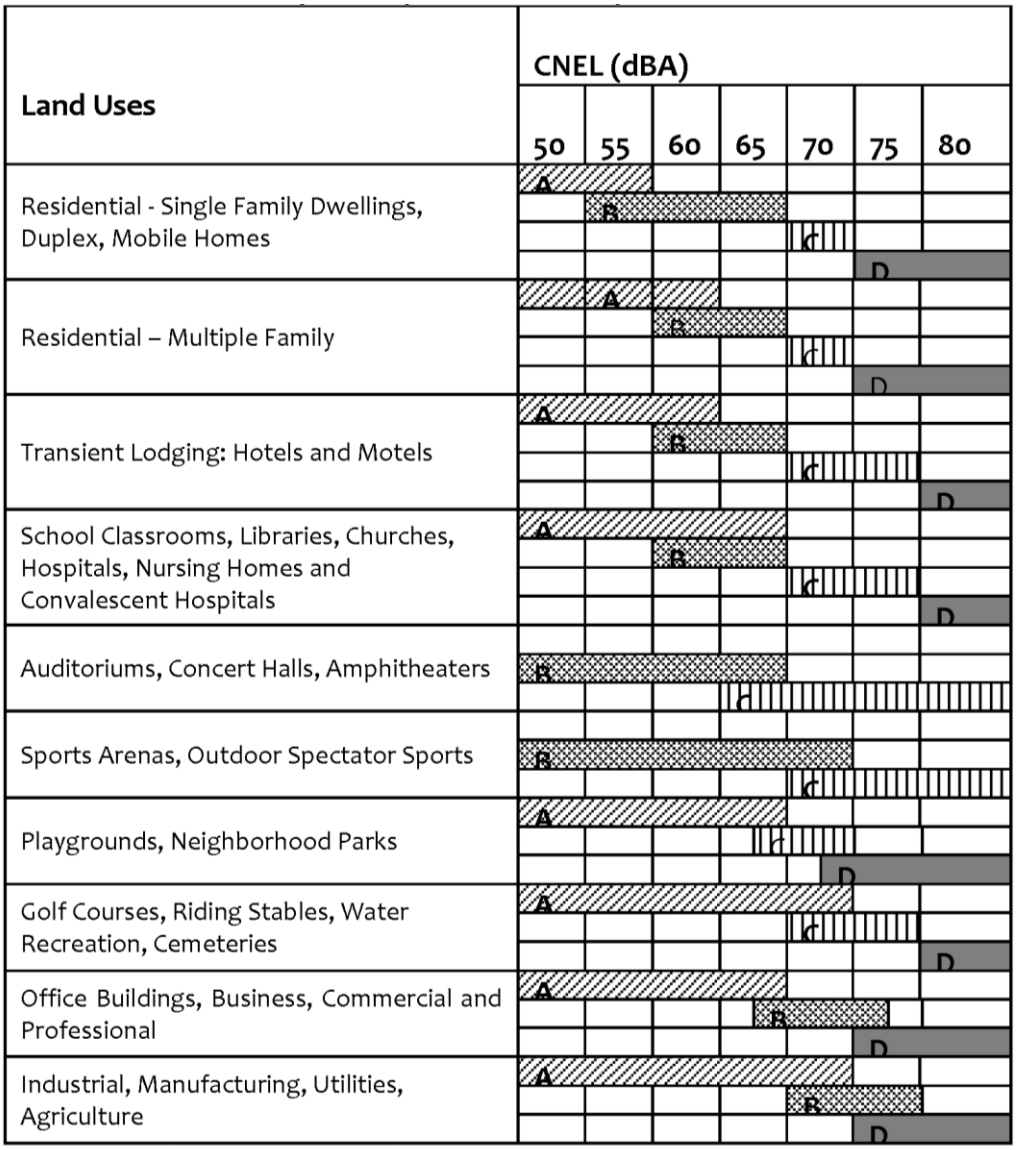
The noise policies specified in the City of La Quinta Environmental Hazards Element provide the guidelines necessary to satisfy this goal. To minimize noise impacts to noise-sensitive land uses, the City has established Policy N-1.1 to identify noise standards consistent with the *Land Use Compatibility for Community Noise Environments*, Table IV-3, for various land uses. The Noise Element also provides several policies to minimize noise impacts from transportation, such as Policy N-1.2, which requires a noise study and any necessary mitigation measures for new developments along roadways where the noise levels are more than 65 dBA CNEL.

The noise criteria identified in the City of La Quinta Environmental Hazards Element, Noise section, are guidelines to evaluate the land use compatibility of transportation related noise. The compatibility criteria, shown on Exhibit 3-A, provides the city with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

The *Land Use Compatibility for Community Noise Environments* (Table IV-3) matrix in the City of La Quinta General Plan provides guidelines to evaluate the acceptability of the transportation related noise level impacts. Noise-sensitive land uses, such as single-family residential, are considered *normally acceptable* with exterior noise levels below 60 dBA CNEL and *conditionally acceptable* with noise levels below 70 dBA CNEL. Hotel land uses are considered *normally acceptable* with exterior noise levels below 65 dBA CNEL and *conditionally acceptable* with exterior noise levels below 70 dBA CNEL. For *conditionally acceptable* land use, *new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.* (10)

Based on the City of La Quinta land use compatibility guidelines and Policy N-1.2, this noise study has been prepared to satisfy an exterior noise level of 65 dBA CNEL for residential uses, a *conditionally acceptable* exterior noise level of 70 dBA CNEL for hotel uses, and an interior noise level of less than 45 dBA CNEL for both residential and hotel uses. This approach is consistent with Policy N-1.2 and Table IV-3 of the General Plan Environmental Hazards Element, Noise section.

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



Source: *California Department of Health Services, "Guidelines for the Preparation and Content of the Noise Element of the General Plan," 1990*

A **Normally Acceptable:** With no special noise reduction requirements assuming standard construction.

B **Conditionally Acceptable:** New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design

C **Normally Unacceptable:** New construction is discouraged. If new construction does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

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

3.4 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of Travertine Specific Plan, noise from construction activities are typically evaluated against standards established under a City's Municipal Code. The Municipal Code noise standards for construction are described below for the City of La Quinta to determine the potential noise impacts at nearby receiver locations. The construction-related noise standards for each City are summarized in Table 3-1 below. The City of La Quinta Municipal Code noise standards are provided in Appendix 3.1.

TABLE 3-1: CONSTRUCTION STANDARDS

Jurisdiction	Municipal Code Section	Permitted Hours of Construction Activity		Construction Noise Level Standards
La Quinta	6.08.050	**October 1st to April 30th** 7:00 a.m. to 5:30 p.m. Mondays to Fridays	**May 1st to September 30th** 6:00 a.m. to 7:00 p.m. Mondays to Fridays	n/a
		All Year: 8:00 a.m. to 5:00 p.m. Saturdays; no activity Sundays and holidays		

"n/a" = The City of La Quinta does not specify specific construction noise level standards.

To control noise impacts associated with the construction of the proposed Project, the City has established limits to the hours of operation. The City of La Quinta Municipal Code, Section 6.08.050 indicates that construction, shall be limited to the hours of 7:00 a.m. to 5:30 p.m. Mondays to Fridays during the months of October to April, and to the hours of 6:00 a.m. to 7:00 p.m. Mondays to Fridays during the months of May to September. All year, construction activities are limited to 8:00 a.m. to 5:00 p.m. on Saturdays, with no activity allowed on Sundays. (11) However, the City's General Plan and Municipal Code do not establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes as the *generation of noise levels in excess of standards* or as a *substantial temporary or periodic noise increase*, the following construction noise level thresholds are used in this noise study.

3.4.1 CONSTRUCTION NOISE LEVEL COMPLIANCE THRESHOLD

To evaluate whether the Project will generate potentially significant temporary construction noise levels at off-site sensitive receiver locations, a construction-related noise level threshold is adopted from the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual*. (8) 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

Since the City of La Quinta does not identify specific construction vibration level standards, the County of Riverside General Plan Noise Element Policy N 16.3 vibration standards are used in this noise study. Policy N 16.3 identifies a motion velocity perception threshold for vibration due to passing trains of 0.01 inches per second (in/sec) over the range of one to 100 Hz. (12) For the purposes of this analysis, the perception threshold of 0.01 in/sec shall be used to assess the potential impacts due to Project construction at nearby sensitive receiver locations.

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

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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. (1) 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?

While the City of La Quinta General Plan provides direction on noise compatibility, and the City of La Quinta Municipal Code establishes noise standards by land use type that are sufficient to assess the significance of noise impacts, they do not define the levels at which increases project related off-site traffic and operational noise levels are considered substantial for use under CEQA Guideline A. Therefore, this section identifies noise level increase thresholds used to describe the amount to which a given noise level increase is considered acceptable.

4.1 CEQA GUIDELINES NOT FURTHER ANALYZED

The Project site is located roughly 19 miles southeast of Palm Springs International Airport, and five miles west of the Jacqueline Cochran Regional Airport. Therefore, the Project site is not located within two miles of a public airport or the vicinity of a private airstrip, and as such, no impact related to the exposure of people residing or working in the Project area to excessive airport related noise levels is anticipated.

4.2 NOISE-SENSITIVE RECEIVERS

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

4.2.1 SUBSTANTIAL PERMANENT NOISE LEVEL INCREASES

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) (14) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (i.e., CNEL).

For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. Per FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS

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

Federal Interagency Committee on Noise (FICON), 1992.

4.2.2 SUBSTANTIAL TEMPORARY OF PERIODIC NOISE LEVEL INCREASES

Due to the temporary, short-term nature of noise-generating construction activities, the temporary or periodic noise level increases over the existing ambient conditions must be considered under CEQA Guideline D, consistent with the legal case, *Friends of Riverside's Hills v. Riverside Transportation Commission, et al.* (15) Therefore, the Caltrans *Traffic Noise Analysis Protocol* 12 dBA L_{eq} *substantial* noise level increase threshold is used in this analysis to assess temporary noise level increases. (16) If the Project-related construction noise levels generate a temporary noise level increase above the existing ambient noise levels of up to 12 dBA L_{eq}, then the Project construction noise level increases will be considered a potentially significant impact. Although the Caltrans recommendations were specifically developed to assess traffic noise impacts, the 12 dBA L_{eq} substantial noise level increase threshold is used in California to address noise level increases with the potential to exceed existing conditions. (16)

4.3 NON-NOISE-SENSITIVE RECEIVERS

To describe potential the off-site traffic noise level impacts on non-noise sensitive lands uses adjacent to roadway segments carrying Project related traffic, this analysis has identified thresholds of significance from the City of La Quinta General Plan. Table IV-3, Environmental Hazards Element Noise section of the General Plan, identifies transportation-related noise level criteria for land use compatibility. Per the City's *Land Use Compatibility for Community Noise Environments* criteria, non-noise-sensitive within the industrial, manufacturing, utilities and agricultural land use category in the Project study area are *normally acceptable* with exterior noise levels approaching 70 dBA CNEL and *conditionally acceptable* with exterior noise levels approaching 75 dBA CNEL. For the purposes of this noise study, non-noise sensitive land use within the industrial, manufacturing, utilities and agricultural uses land use category are considered *normally acceptable* land use with exterior noise levels below 70 dBA CNEL. (10)

To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria are used. When the without Project noise levels at the non-noise-sensitive land uses are below the 70 dBA CNEL exterior noise level 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 70 dBA CNEL exterior noise level standard, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the City of La Quinta General Plan, Chapter 4, Environmental Hazards Element Noise Section Table IV-3 exterior noise level criteria.

4.4 SIGNIFICANCE CRITERIA SUMMARY

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

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g., residential, etc.):
    - are less than 60 dBA and the Project creates a *readily perceptible* 5 dBA or greater Project-related noise level increase: or
    - range from 60 to 65 dBA and the Project creates a *barely perceptible* 3 dBA or greater Project-related noise level increase: or
    - already exceed 65 dBA, and the Project creates a community noise level increase of greater than 1.5 dBA (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g., agricultural, etc.):
    - are less than the City of La Quinta General Plan, Chapter 4, Environmental Hazards Element Table IV-3 70 dBA CNEL noise level standard and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase: or

- are greater than the City of La Quinta General Plan, Chapter 4, Environmental Hazards Element Table IV-3 70 dBA CNEL noise level standard and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase.

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site Traffic Noise	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[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 Traffic Noise[3]	Noise-Sensitive	Exterior Noise Level Criteria	65 dBA CNEL	
		Interior Noise Level Criteria	45 dBA CNEL	
Construction[4]	Noise-Sensitive	**October 1st to April 30th** 7:00 a.m. to 5:30 p.m. Mondays to Fridays	**May 1st to September 30th** 6:00 a.m. to 7:00 p.m. Mondays to Fridays	
		All Year: 8:00 a.m. to 5:00 p.m. Saturdays; no activity Sundays and holidays		
		Exterior Noise Level Threshold[5]	80 dBA L_{eq}	n/a
		Noise Level Increase[4]	12 dBA L_{eq}	n/a
		Vibration Level Threshold[5]	0.01 in/sec RMS	n/a

[1] FICON, 1992.
[2] City of La Quinta General Plan, Chapter 4, Environmental Hazards Element Table IV-3
[3] City of La Quinta Municipal Code, Ordinance 550, Section 9.100.210 (B) & General Plan Noise Element Policy N-1.2.
[4] City of La Quinta Municipal Code, Section 6.08.050 (Appendix 3.1).
[5] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[6] Threshold based on the substantial increase criteria in the Caltrans Traffic Noise Analysis Protocol, May 2011.
[7] County of Riverside General Plan Noise Element, Policy 16.3.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

ON-SITE TRANSPORTATION NOISE

- If the on-site exterior noise levels exceed 65 dBA CNEL at the private outdoor living areas of residential homes, or common outdoor areas at hotel uses. Interior noise levels shall not exceed 45 dBA CNEL for residential homes and the hotel building (City of La Quinta Municipal Code, Ordinance 550, Section 9.100.210 (B) & General Plan Noise Element Policy N-1.2).

CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities:
  - occur at any time other than the permitted hours identified on Table 4-2 (City of La Quinta Municipal Code, Section 6.08.050).
  - create noise levels which exceed the 80 dBA L_{eq} reasonable noise level threshold at nearby sensitive receiver locations (FTA, *Transit Noise and Vibration Impact Assessment Manual*).
  - create noise levels which exceed the 75 dBA Leq acceptable noise level threshold at the nearby sensitive conservation area (CVMSHCP).

  - generate temporary Project construction-related noise level increases which exceed the 12 dBA Leq *substantial* noise level increase threshold at noise-sensitive receiver locations (Caltrans, Traffic Noise Analysis Protocol).

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

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, eight 24-hour noise level measurements were taken at sensitive receiver locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, August 16th, 2017. 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. (17)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent any part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (2) 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 (Leq). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the noise levels on Quarry Ranch Road north of the Project site near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 60.5 dBA CNEL. The hourly noise levels measured at location L1 ranged from 49.2 to 63.4 dBA Leq during the daytime hours and from 37.9 to 56.1 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 59.8 dBA Leq with an average nighttime noise level of 49.1 dBA Leq.
- Location L2 represents the noise levels on Avenue 58 north of the Project site near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 62.8 dBA CNEL. The hourly noise levels measured at location L2 ranged from 48.6 to 62.0 dBA Leq during the daytime hours and from 42.3 to 61.2 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 57.7 dBA Leq with an average nighttime noise level of 55.9 dBA Leq.
- Location L3 represents the noise levels south of Avenue 58 on Madison Street northeast of the Project site near existing residential homes. The 24-hour CNEL indicates that the overall exterior noise level is 60.1 dBA CNEL. At location L3 the background ambient noise levels ranged from 47.1 to 58.0 dBA Leq during the daytime hours to levels of 38.2 to 59.4 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 54.8 dBA Leq with an average nighttime noise level of 53.2 dBA Leq.
- Location L4 represents the noise levels on Avenue 60 east of the Project site near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 60.1 dBA CNEL. The hourly noise levels measured at location L4 ranged from 47.9 to 59.5 dBA Leq during the daytime hours and from 40.4 to 58.9 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 55.6 dBA Leq with an average nighttime noise level of 52.8 dBA Leq.
- Location L5 represents the noise levels east of the Project site on Monroe Street near existing residential homes south of Avenue 62. The noise level measurements collected show an overall 24-hour exterior noise level of 49.0 dBA CNEL. The hourly noise levels measured at location L5 ranged from 37.4 to 46.7 dBA Leq during the daytime hours and from 37.4 to 47.8 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 42.9 dBA Leq with an average nighttime noise level of 42.2 dBA Leq.

- Location L6 represents the noise levels east of the Project site on Monroe Street near an existing park, north of Avenue 64. The 24-hour CNEL indicates that the overall exterior noise level is 51.8 dBA CNEL. At location L6 the background ambient noise levels ranged from 39.7 to 58.2 dBA Leq during the daytime hours to levels of 39.1 to 47.0 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 50.0 dBA Leq with an average nighttime noise level of 43.0 dBA Leq.
- Location L7 represents the noise levels near on Avenue 62 east of the Project site near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 55.2 dBA CNEL. The hourly noise levels measured at location L7 ranged from 39.4 to 54.8 dBA Leq during the daytime hours and from 40.4 to 54.7 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 49.8 dBA Leq with an average nighttime noise level of 48.2 dBA Leq.
- Location L8 represents the noise levels on Avenue 60, west of Madison Street, near existing residential homes and future residential use. The noise level measurements collected show an overall 24-hour exterior noise level of 60.4 dBA CNEL. The hourly noise levels measured at location L8 ranged from 51.9 to 54.1 dBA Leq during the daytime hours and from 52.2 to 55.3 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 53.2 dBA Leq with an average nighttime noise level of 53.9 dBA Leq.

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

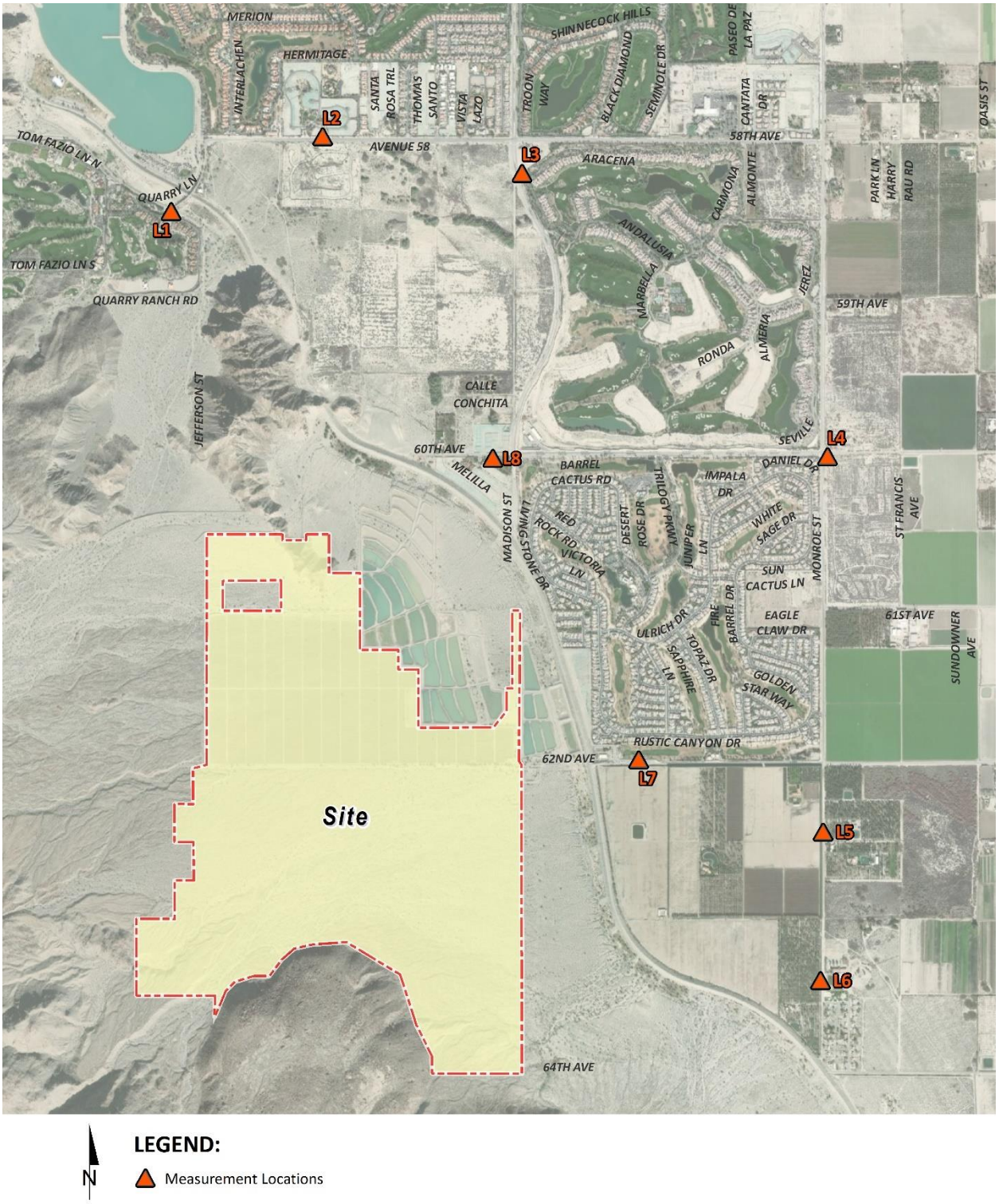
The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with the arterial roadway network. The 24-hour existing noise level measurements shown on Table 5-1 present the existing ambient noise conditions.

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

Location[1]	Description	Energy Average Hourly Noise Level (dBA Leq)[2]		CNEL
		Daytime	Nighttime	
L1	Located on Quarry Ranch Road north of the Project site near existing residential homes.	59.8	49.1	60.5
L2	Located on Avenue 58 North of the Project site near existing residential homes.	57.7	55.9	62.8
L3	Located south of Avenue 58 on Madison Street northeast of the Project site near existing residential homes.	54.8	53.2	60.1
L4	Located on Avenue 60 east of the Project site near existing residential homes.	55.6	52.8	60.1
L5	Located east of the Project site on Monroe Street near existing residential homes south of Avenue 62.	42.9	42.2	49.0
L6	Located east of the Project site on Monroe Street near an existing park, north of Avenue 64.	50.0	43.0	51.8
L7	Located near on Avenue 62 east of the Project site near existing residential homes.	49.8	48.2	55.2
L8	Located on Avenue 60, west of Madison Street, near existing residential homes and future residential use.	53.2	53.9	60.4

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

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS



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6 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to estimate and analyze the future traffic noise environment. Consistent with 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. (18) 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. (19) 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. (20)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of La Quinta General Plan Circulation Element, and the posted vehicle speeds. For this analysis, soft site conditions are used to analyze the traffic noise impacts within the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. Research 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 noise study. (20)

Consistent with *Travertine Specific Plan Traffic Analysis* prepared by Urban Crossroads, Inc. (21) provides off-site roadway segment analysis for the following traffic scenarios.

- Existing Conditions
- Existing Plus Ambient Growth Plus Cumulative Projects with Project buildout (Phase 3)
- Phase 3 (2031) without Project Conditions
- Phase 3 (2031) with Project Conditions
- Year 2040 Conditions with Madison Street extension

- Year 2040 Conditions without Madison Street extension (GPA Option 1)
- Year 2040 Conditions without Madison Street extension and without Jefferson Street /Avenue 62 extensions (GPA Option 2)

The average daily traffic (ADT) volumes used for this study are presented on Table 6-2. Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits and Table 6-4 presents the traffic flow distributions (vehicle mix) used for this analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks, and heavy trucks for input into the FHWA noise prediction model.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Land Use[1]	Classification	Distance to Land Use (Feet)[2]	Vehicle Speed (mph)
1	Av. 58	w/o Madison St.	LDR/MHDR/OS/GC	Secondary Arterial	44'	50
2	Av. 58	w/o Monroe St.	LDR/OS/GC	Secondary Arterial	44'	50
3	Av. 58	w/o Jackson St.	RR/MHDR/A	Secondary	50'	50
4	Madison St.	s/o Av. 56	LDR/OS/MHDR	Primary Arterial	43'	55
5	Av. 60	w/o Jackson St.	MDR/CR/A	Arterial	64'	55
6	Av. 62	w/o Monroe St.	OS/MCF/MHDR	Modified Secondary	42'	50
7	Av. 62	w/o Jackson St.	TL/A	Secondary	50'	50
8	Monroe St.	s/o Av. 60	LDR/MHDR/OS	Secondary Arterial	44'	50
9	Monroe St.	s/o Av. 58	GC/LDR/OS/MHDR	Primary Arterial	43'	55
10	Monroe St.	s/o Av. 56	GC/LDR/OS	Primary Arterial	43'	55
11	Jackson St.	s/o Airport Bl.	A/RR	Arterial	64'	55

[1] City of La Quinta General Plan Land Use Map Exhibit 11-1, Eastern Coachella Valley Area Plan Land Use Plan Figure 3.
[2] Centerline Distance to Receiving Land Use based upon the right-of-way distances for each roadway classification provided in the General Plan Circulation Element.
"LDR"= Low Density Residential; "GC"= General Commercial; "OS"= Open Space; "MHDR"= Medium/High Density Residential; "A"= Agriculture; "RR"= Rural Residential; "TL"= Tribal Lands; "MCF"= Major Community Facilities.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]						
			Existing		Phase 3 (2031)		2040		
			Without Project	With Project	Without Project	With Project	With Madison	With GPA 1	With GPA 2
1	Av. 58	w/o Madison St.	1,600	7,300	6,000	11,600	12,000	12,500	13,500
2	Av. 58	w/o Monroe St.	2,300	4,000	8,100	9,800	10,200	14,000	14,000
3	Av. 58	w/o Jackson St.	1,800	3,000	7,700	8,900	18,600	19,000	19,000
4	Madison St.	s/o Av. 56	6,700	10,100	20,500	23,900	35,600	34,000	34,000
5	Av. 60	w/o Jackson St.	1,200	1,800	6,100	6,700	12,000	15,000	15,000
6	Av. 62	w/o Monroe St.	600	6,300	1,800	7,500	9,600	13,000	14,000
7	Av. 62	w/o Jackson St.	1,700	4,000	6,700	9,000	19,800	19,000	19,000
8	Monroe St.	s/o Av. 60	1,600	5,000	8,200	11,600	19,000	25,000	25,000
9	Monroe St.	s/o Av. 58	2,700	5,500	12,100	14,900	26,000	27,000	27,000
10	Monroe St.	s/o Av. 56	3,400	6,800	12,500	15,900	25,000	26,000	27,000
11	Jackson St.	s/o Airport Bl.	2,400	3,500	10,400	11,500	28,400	29,000	29,000

[1] Travertine Specific Plan Traffic Impact Analysis, April 2021, Urban Crossroads, Inc.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	75.55%	13.96%	10.49%	100.00%
Medium Trucks	48.91%	2.17%	48.91%	100.00%
Heavy Trucks	47.30%	5.41%	47.30%	100.00%

[1] 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 6-4: DISTRIBUTION OF TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

Roadway	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Roadways[1]	97.42%	1.84%	0.74%	100.00%

[1] County of Riverside Office of Industrial Hygiene Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures.

6.3 ON-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

The on-site roadway parameters including the average daily traffic (ADT) volumes used for this study are presented on Table 6-5. To predict the future on-site noise environment at the Project site, parameters including the number of lanes and daily volume thresholds were obtained from the *Travertine Specific Plan Traffic Impact Analysis*. The exterior noise level impacts were placed five feet above the finished floor elevation at the outdoor living areas and proposed building façades. Second-floor receivers were located 14 feet above the finished floor elevation.

TABLE 6-5: ON-SITE ROADWAY PARAMETERS

Roadway	Lanes	Classification[1]	Average Daily Traffic Volume[1]	Speed Limit (mph)	Site Conditions
Jefferson Street	2	Secondary Arterial	5,600	45	Soft
North Loop	2	Secondary Arterial	2,000	45	Soft
South Loop	2	Collector	2,700	45	Soft

[1] Travertine Specific Plan Traffic Phasing Analysis General Plan Buildout (2040)

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7 OFF-SITE TRAFFIC NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with development of the proposed Project, noise contours were developed based on *Travertine Specific Plan Traffic Impact Analysis*. (21) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- Existing: This scenario refers to the existing present-day noise 2019 conditions, without the proposed Project.
- Existing plus Ambient plus Cumulative (EAC) Project Phase 1 (2026): This scenario refers to the existing plus ambient plus cumulative noise conditions at 2026 without and with the proposed Project Phase 1. Project Phase 1 includes 530 single family detached residential homes, 74 duplex residential units, and PA 11 resort/golf uses (golf practice, golf academy, and banquet accommodations).
- Existing plus Ambient plus Cumulative (EAC) Project Phase 2 (2029): This scenario refers to the existing plus ambient plus cumulative noise conditions at 2029 without and with the proposed Project Phase 2. Project Phase 2 includes 673 single family detached residential homes, 237 duplex residential units, and PA 11 resort/golf uses (golf practice, golf academy, and banquet accommodations).
- Existing plus Ambient plus Cumulative (EAC) Project Phase 3 (2031): This scenario refers to the existing plus ambient plus cumulative noise conditions at 2031 without and with the proposed Project Phase 3. Project Phase 3 includes 758 single family detached residential homes, 442 duplex residential units, a 100-room resort hotel, and PA 11 resort/golf uses (golf practice, golf academy, and banquet accommodations).

7.1 TRAFFIC NOISE CONTOURS

To quantify the Project's traffic noise impacts on the surrounding areas, the changes in traffic noise levels on roadway segments surrounding the Project were calculated based on the changes in the average daily traffic volumes. Based on the noise impact significance criteria described in Section 4 and shown on Table 4-2, a significant off-site traffic noise level impact occurs:

- When the noise levels at existing and future noise-sensitive land uses (e.g., residential, etc.):
    - are less than 60 dBA and the Project creates a *readily perceptible* 5 dBA or greater Project-related noise level increase: or
    - range from 60 to 65 dBA and the Project creates a *barely perceptible* 3 dBA or greater Project-related noise level increase: or
    - already exceed 65 dBA, and the Project creates a community noise level impact of greater than 1.5 dBA (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g., agricultural, etc.):
    - are less than the City of La Quinta General Plan, Chapter 4, Environmental Hazards Element Table IV-3 70 dBA CNEL noise level standard and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase: or

- are greater than the City of La Quinta General Plan, Chapter 4, Environmental Hazards Element Table IV-3 70 dBA CNEL noise level standard and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase.

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours include the additional barrier attenuation provided by existing noise barriers in the Project study area. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area.

Tables 7-1 through 7-7 present a summary of the exterior traffic noise levels, without barrier attenuation, for the 11 study area roadway segments analyzed in the *Travertine Specific Plan Traffic Impact Analysis*. (21) Appendix 7.1 includes a summary of the traffic noise level contours for each of the following seven traffic scenarios.

- Existing Conditions
- Existing With Project (Phase 3) Conditions
- Phase 3 (2031) Without Project
- Phase 3 (2031) With Project
- Year 2040 Conditions with Madison Street extension
- Year 2040 Conditions without Madison Street extension (GPA Option 1). Consistent with the *Travertine Specific Plan Traffic Impact Analysis*, this scenario includes the termination of Madison Street as a General Plan roadway, south of Avenue 60; future Jefferson Street connection from Avenue 58 to Avenue 62; and, emergency vehicle access (EVA) is provided via Madison Street, from the northerly boundary of the Project's Planning Area 18 to Avenue 60.
- Year 2040 Conditions without Madison Street extension and with Project Entry Gates (GPA Option 2). Consistent with the *Travertine Specific Plan Traffic Impact Analysis*, this scenario includes the termination of Madison Street as a General Plan roadway, south of the Avenue 60; future Jefferson Street connection from Avenue 58 to Project boundary; the deletion of Jefferson Street as General Plan roadway south of the hypothetical westerly extension of Avenue 60, and the deletion of Avenue 62 west of the hypothetical southerly extension of Madison Street; on-site entry gates on Jefferson Street; Jefferson Street is a private roadway within the Project boundary, and emergency vehicle access (EVA) is provided via Madison Street, from the northerly boundary of the Project's Planning Area 18 to Avenue 60.

TABLE 7-1: EXISTING NOISE 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	Av. 58	w/o Madison St.	LDR/MHDR/OS/GC	63.6	RW	RW	77
2	Av. 58	w/o Monroe St.	LDR/OS/GC	65.2	RW	45	98
3	Av. 58	w/o Jackson St.	RR/MHDR/A	62.5	RW	RW	73
4	Madison St.	s/o Av. 56	LDR/OS/MHDR	70.3	45	97	209
5	Av. 60	w/o Jackson St.	MDR/CR/A	60.4	RW	RW	68
6	Av. 62	w/o Monroe St.	OS/MCF/MHDR	58.8	RW	RW	RW
7	Av. 62	w/o Jackson St.	TL/A	62.3	RW	RW	71
8	Monroe St.	s/o Av. 60	LDR/MHDR/OS	63.6	RW	RW	77
9	Monroe St.	s/o Av. 58	GC/LDR/OS/MHDR	66.3	RW	53	114
10	Monroe St.	s/o Av. 56	GC/LDR/OS	67.3	RW	62	133
11	Jackson St.	s/o Airport Bl.	A/RR	63.4	RW	RW	108

[1] City of La Quinta General Plan Land Use Map Exhibit 11-1, Eastern Coachella Valley Area Plan Land Use Plan Figure 3.
[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. "LDR"= Low Density Residential; "GC"= General Commercial; "OS"= Open Space; "MHDR"= Medium/High Density Residential; "A"= Agriculture; "RR"= Rural Residential; "TL"= Tribal Lands; "MCF"= Major Community Facilities.

TABLE 7-2: EXISTING WITH PROJECT (PHASE 3) NOISE 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	Av. 58	w/o Madison St.	LDR/MHDR/OS/GC	70.2	46	98	211
2	Av. 58	w/o Monroe St.	LDR/OS/GC	67.6	RW	66	141
3	Av. 58	w/o Jackson St.	RR/MHDR/A	64.7	RW	RW	103
4	Madison St.	s/o Av. 56	LDR/OS/MHDR	72.1	59	127	275
5	Av. 60	w/o Jackson St.	MDR/CR/A	62.2	RW	RW	89
6	Av. 62	w/o Monroe St.	OS/MCF/MHDR	69.0	RW	77	167
7	Av. 62	w/o Jackson St.	TL/A	66.0	RW	58	125
8	Monroe St.	s/o Av. 60	LDR/MHDR/OS	68.6	RW	76	164
9	Monroe St.	s/o Av. 58	GC/LDR/OS/MHDR	69.4	RW	85	183
10	Monroe St.	s/o Av. 56	GC/LDR/OS	70.4	45	98	211
11	Jackson St.	s/o Airport Bl.	A/RR	65.1	RW	65	139

[1] City of La Quinta General Plan Land Use Map Exhibit 11-1, Eastern Coachella Valley Area Plan Land Use Plan Figure 3.
[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. "LDR"= Low Density Residential; "GC"= General Commercial; "OS"= Open Space; "MHDR"= Medium/High Density Residential; "A"= Agriculture; "RR"= Rural Residential; "TL"= Tribal Lands; "MCF"= Major Community Facilities.

TABLE 7-3: PHASE 3 (2031) WITHOUT PROJECT NOISE 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	Av. 58	w/o Madison St.	LDR/MHDR/OS/GC	69.4	RW	86	185
2	Av. 58	w/o Monroe St.	LDR/OS/GC	70.7	49	105	226
3	Av. 58	w/o Jackson St.	RR/MHDR/A	68.8	RW	90	194
4	Madison St.	s/o Av. 56	LDR/OS/MHDR	75.2	95	204	440
5	Av. 60	w/o Jackson St.	MDR/CR/A	67.5	RW	94	202
6	Av. 62	w/o Monroe St.	OS/MCF/MHDR	63.5	RW	RW	72
7	Av. 62	w/o Jackson St.	TL/A	68.2	RW	82	176
8	Monroe St.	s/o Av. 60	LDR/MHDR/OS	70.7	49	106	228
9	Monroe St.	s/o Av. 58	GC/LDR/OS/MHDR	72.9	67	144	310
10	Monroe St.	s/o Av. 56	GC/LDR/OS	73.0	68	147	316
11	Jackson St.	s/o Airport Bl.	A/RR	69.8	RW	133	288

[1] City of La Quinta General Plan Land Use Map Exhibit 11-1, Eastern Coachella Valley Area Plan Land Use Plan Figure 3.
[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. "LDR"= Low Density Residential; "GC"= General Commercial; "OS"= Open Space; "MHDR"= Medium/High Density Residential; "A"= Agriculture; "RR"= Rural Residential; "TL"= Tribal Lands; "MCF"= Major Community Facilities.

TABLE 7-4: PHASE 3 (2031) WITH PROJECT NOISE 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	Av. 58	w/o Madison St.	LDR/MHDR/OS/GC	72.2	62	134	288
2	Av. 58	w/o Monroe St.	LDR/OS/GC	71.5	55	119	257
3	Av. 58	w/o Jackson St.	RR/MHDR/A	69.4	RW	99	213
4	Madison St.	s/o Av. 56	LDR/OS/MHDR	75.8	105	226	487
5	Av. 60	w/o Jackson St.	MDR/CR/A	67.9	RW	100	215
6	Av. 62	w/o Monroe St.	OS/MCF/MHDR	69.7	RW	87	187
7	Av. 62	w/o Jackson St.	TL/A	69.5	RW	100	215
8	Monroe St.	s/o Av. 60	LDR/MHDR/OS	72.2	62	134	288
9	Monroe St.	s/o Av. 58	GC/LDR/OS/MHDR	73.8	77	165	356
10	Monroe St.	s/o Av. 56	GC/LDR/OS	74.0	80	172	371
11	Jackson St.	s/o Airport Bl.	A/RR	70.2	66	143	308

[1] City of La Quinta General Plan Land Use Map Exhibit 11-1, Eastern Coachella Valley Area Plan Land Use Plan Figure 3.
[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. "LDR"= Low Density Residential; "GC"= General Commercial; "OS"= Open Space; "MHDR"= Medium/High Density Residential; "A"= Agriculture; "RR"= Rural Residential; "TL"= Tribal Lands; "MCF"= Major Community Facilities.

TABLE 7-5: YEAR 2040 WITH MADISON EXTENSION NOISE 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	Av. 58	w/o Madison St.	LDR/MHDR/OS/GC	72.4	63	137	294
2	Av. 58	w/o Monroe St.	LDR/OS/GC	71.7	57	123	264
3	Av. 58	w/o Jackson St.	RR/MHDR/A	72.6	75	162	349
4	Madison St.	s/o Av. 56	LDR/OS/MHDR	77.5	137	295	636
5	Av. 60	w/o Jackson St.	MDR/CR/A	70.4	68	147	316
6	Av. 62	w/o Monroe St.	OS/MCF/MHDR	70.8	48	102	221
7	Av. 62	w/o Jackson St.	TL/A	72.9	78	169	363
8	Monroe St.	s/o Av. 60	LDR/MHDR/OS	74.4	86	186	400
9	Monroe St.	s/o Av. 58	GC/LDR/OS/MHDR	76.2	111	239	516
10	Monroe St.	s/o Av. 56	GC/LDR/OS	76.0	108	233	502
11	Jackson St.	s/o Airport Bl.	A/RR	74.2	121	261	562

[1] City of La Quinta General Plan Land Use Map Exhibit 11-1, Eastern Coachella Valley Area Plan Land Use Plan Figure 3.
[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. "LDR"= Low Density Residential; "GC"= General Commercial; "OS"= Open Space; "MHDR"= Medium/High Density Residential; "A"= Agriculture; "RR"= Rural Residential; "TL"= Tribal Lands; "MCF"= Major Community Facilities.

TABLE 7-6: YEAR 2040 GPA OPTION 1 NOISE 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	Av. 58	w/o Madison St.	LDR/MHDR/OS/GC	72.6	65	140	302
2	Av. 58	w/o Monroe St.	LDR/OS/GC	73.1	70	151	326
3	Av. 58	w/o Jackson St.	RR/MHDR/A	72.7	76	164	354
4	Madison St.	s/o Av. 56	LDR/OS/MHDR	77.3	133	286	617
5	Av. 60	w/o Jackson St.	MDR/CR/A	71.4	79	170	367
6	Av. 62	w/o Monroe St.	OS/MCF/MHDR	72.1	58	125	270
7	Av. 62	w/o Jackson St.	TL/A	72.7	76	164	354
8	Monroe St.	s/o Av. 60	LDR/MHDR/OS	75.6	103	223	480
9	Monroe St.	s/o Av. 58	GC/LDR/OS/MHDR	76.3	114	245	529
10	Monroe St.	s/o Av. 56	GC/LDR/OS	76.2	111	239	516
11	Jackson St.	s/o Airport Bl.	A/RR	74.2	123	264	570

[1] City of La Quinta General Plan Land Use Map Exhibit 11-1, Eastern Coachella Valley Area Plan Land Use Plan Figure 3.
[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. "LDR"= Low Density Residential; "GC"= General Commercial; "OS"= Open Space; "MHDR"= Medium/High Density Residential; "A"= Agriculture; "RR"= Rural Residential; "TL"= Tribal Lands; "MCF"= Major Community Facilities.

TABLE 7-7: YEAR 2040 GPA OPTION 2 NOISE 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	Av. 58	w/o Madison St.	LDR/MHDR/OS/GC	72.9	69	148	318
2	Av. 58	w/o Monroe St.	LDR/OS/GC	73.1	70	151	326
3	Av. 58	w/o Jackson St.	RR/MHDR/A	72.7	76	164	354
4	Madison St.	s/o Av. 56	LDR/OS/MHDR	77.3	133	286	617
5	Av. 60	w/o Jackson St.	MDR/CR/A	71.4	79	170	367
6	Av. 62	w/o Monroe St.	OS/MCF/MHDR	72.4	61	132	284
7	Av. 62	w/o Jackson St.	TL/A	72.7	76	164	354
8	Monroe St.	s/o Av. 60	LDR/MHDR/OS	75.6	103	223	480
9	Monroe St.	s/o Av. 58	GC/LDR/OS/MHDR	76.3	114	245	529
10	Monroe St.	s/o Av. 56	GC/LDR/OS	76.3	114	245	529
11	Jackson St.	s/o Airport Bl.	A/RR	74.2	123	264	570

[1] City of La Quinta General Plan Land Use Map Exhibit 11-1, Eastern Coachella Valley Area Plan Land Use Plan Figure 3.
[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. "LDR"= Low Density Residential; "GC"= General Commercial; "OS"= Open Space; "MHDR"= Medium/High Density Residential; "A"= Agriculture; "RR"= Rural Residential; "TL"= Tribal Lands; "MCF"= Major Community Facilities.

7.2 EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing off-site traffic noise levels plus traffic noise generated by the proposed Project (Phase 3) has been included in this report. This condition is provided solely for informational purposes and will not occur, since the Project will not be fully developed and occupied under Existing conditions. Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels are expected to range from 58.8 to 70.3 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project (Phase 3) conditions will range from 62.2 to 72.1 dBA CNEL. Table 7-8 shows that the Project (Phase 3) off-site traffic noise level impacts on Existing conditions will range from 1.8 to 10.2 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-2, eight of the study area roadway segments are shown to experience *potentially significant* off-site traffic noise level increases due to the development of the full Project (Phase 3) on Existing conditions.

However, as the background ambient and cumulative traffic volumes increase, the Project's incremental project contributions will diminish over time. By Phase 3 (2031) conditions, the off-site traffic analysis shows that the Project's contributions to the roadway noise levels will be reduced.

7.3 PHASE 3 (2031) PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-9 presents a comparison of Phase 3 (2031) without and with Project conditions CNEL noise levels. Table 7-3 shows that the exterior noise levels are expected to range from 63.5 to 75.2 dBA CNEL without the Project. Table 7-4 presents Phase 3 (2031) with Project conditions noise level contours that are expected to range from 67.9 to 75.8 dBA CNEL. As shown on Table 7-8, the Project will generate a noise level increase ranging from 0.0 to 6.2 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *potentially significant* under Phase (2031) with Project conditions on the following roadway segments:

- Avenue 58 west of Madison Street (Segment #1)
- Avenue 62 west of Monroe Street (Segment #6)
- Monroe Street south of Avenue 60 (Segment #8)

The three roadway segments estimated to experience *potentially significant* noise level impacts due to Project-related traffic are located near the Project Site.

Avenue 58 west of Madison Street (Segment #1): This roadway segment represents the planned southerly extension of South Jefferson south of Avenue 58 west of Madison Street near The Quarry at La Quinta golf course. A detailed review of this roadway segment shows that the noise sensitive residential receivers in The Quarry at La Quinta may be impacted by future Project traffic noise from Avenue 58. However, it appears that most of these noise sensitive residential homes benefit from an existing 6-to-8-foot-high berm/noise barrier. Consistent with the City of La Quinta Noise Element, the barrier was constructed to mitigate the future long-range General Plan Roadway network and will provide the noise attenuation needed to satisfy the 65 dBA CNEL exterior noise requirements. Therefore, since the existing noise sensitive residential land use in The Quarry at La Quinta were developed with the appropriate exterior noise mitigation measures to satisfy long-range General Plan buildout traffic conditions and the Project traffic is included as part of the General Plan, the Project related off-site traffic noise increases over time are considered *less than significant* for this segment.

Avenue 62 west of Monroe Street (Segment #6): A detailed review of this roadway segment shows that the noise sensitive Trilogy La Quinta residential community is located north of Avenue 62. This segment has the highest noise level increase since it represents the primary access to the Project site. In combination with the low existing traffic volumes, this segment will likely experience a *potentially significant* off-site traffic noise level increase of 6.2 dBA CNEL when measured at the right-of-way of the receiving land use. However, the noise sensitive residential homes are set back approximately 300 feet from Avenue 62 behind an existing wall. At this distance, the exterior noise levels are estimated at 53.9 dBA CNEL and will not exceed the 65 dBA CNEL exterior noise requirements. Consistent with the City of La Quinta Noise Element, the nearest noise sensitive receivers within the Trilogy La Quinta residential community located north of Avenue 62 will satisfy the 65 dBA CNEL exterior noise requirements.

Therefore, since the existing noise sensitive residential land use in Trilogy La Quinta residential community were developed with the appropriate exterior noise mitigation measures to satisfy

long-range General Plan buildout traffic conditions and the Project traffic is included as part of the General Plan, the Project related off-site traffic noise increases over time are considered *less than significant* for this segment.

Monroe Street south of Avenue 60 (Segment #8): A detailed review of this roadway segment shows that the noise sensitive Trilogy La Quinta residential community is located west of Monroe Street. This community was developed with the benefits of a substantial 8-foot-high noise barrier. Consistent with the City of La Quinta Noise Element, the existing noise barrier was constructed to mitigate the future long-range General Plan Roadway network and will provide the noise attenuation needed to satisfy the 65 dBA CNEL exterior noise requirements. Therefore, since the existing noise sensitive residential land use on Monroe Street south of Avenue 60 was developed with the appropriate exterior noise mitigation measures to satisfy long-range General Plan buildout traffic conditions and the Project traffic is included as part of the General Plan, the Project related off-site traffic noise increases over time are considered *less than significant*.

7.4 PROJECT OFF-SITE TRAFFIC NOISE IMPACTS

The off-site traffic noise analysis recognizes that the Project would generate a noise level increase of up to 10.2 dBA CNEL on Avenue 62 west of Monroe Street (Segment #6) when measured at the property line of the receiving land use. The existing traffic noise levels on this segment are calculated at 58.8 dBA CNEL. The addition of Project (Phase 3) traffic is expected to increase the off-site traffic noise levels to 69.0 dBA CNEL resulting in a project incremental traffic noise level increase of 10.2 dBA CNEL. According to Caltrans, a traffic impact occurs when the future noise level substantially exceeds the existing noise level. In California a substantial noise increase is considered to occur when the project's predicted noise level exceeds the existing noise level by 12 dBA or more. The use of 12 dB was established in California many years ago and is based on the concept that a 10 dB increase generally is perceived as a doubling of loudness. (2 pp. 3-2)

While the relative incremental increase due to the off-site Project traffic noise on Avenue 62 west of Monroe Street (Segment #6) may be considered a doubling of the existing traffic noise levels, it does not exceed the Caltrans 12 dB substantial noise level increase threshold. In addition, the Existing plus Project (Phase 3) condition is provided solely for informational purposes and will not occur, since the Project will not be fully developed and occupied under Existing conditions. The noise levels presented in this analysis are intended to describe the off-site traffic noise levels at the boundary of the roadway segment right-of-way and the property line of the receiving land use and in many cases, this does not represent the backyard of the nearest noise sensitive receivers.

TABLE 7-8: EXISTING WITH PROJECT (PHASE 3) TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Existing CNEL at Receiving Land Use (dBA)[2]			Noise Level Increase Significance Criteria[3]	
				Without Project	With Project	Project Increase	Criteria	Exceeded?
1	Av. 58	w/o Madison St.	LDR/MHDR/OS/GC	63.6	70.2	6.6	3.0	**Yes**
2	Av. 58	w/o Monroe St.	LDR/OS/GC	65.2	67.6	2.4	1.5	**Yes**
3	Av. 58	w/o Jackson St.	RR/MHDR/A	62.5	64.7	2.2	3.0	No
4	Madison St.	s/o Av. 56	LDR/OS/MHDR	70.3	72.1	1.8	1.5	**Yes**
5	Av. 60	w/o Jackson St.	MDR/CR/A	60.4	62.2	1.8	3.0	No
6	Av. 62	w/o Monroe St.	OS/MCF/MHDR	58.8	69.0	10.2	5.0	**Yes**
7	Av. 62	w/o Jackson St.	TL/A	62.3	66.0	3.7	3.0	**Yes**
8	Monroe St.	s/o Av. 60	LDR/MHDR/OS	63.6	68.6	5.0	3.0	**Yes**
9	Monroe St.	s/o Av. 58	GC/LDR/OS/MHDR	66.3	69.4	3.1	1.5	**Yes**
10	Monroe St.	s/o Av. 56	GC/LDR/OS	67.3	70.4	3.1	1.5	**Yes**
11	Jackson St.	s/o Airport Bl.	A/RR	63.4	65.1	1.7	3.0	No

[1] City of La Quinta General Plan Land Use Map Exhibit 11-1, Eastern Coachella Valley Area Plan Land Use Plan Figure 3.
[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 off-site transportation related noise level increase exceeding the significance criteria (Table 4-2)?
"LDR"= Low Density Residential; "GC"= General Commercial; "OS"= Open Space; "MHDR"= Medium/High Density Residential; "A"= Agriculture; "RR"= Rural Residential; "TL"= Tribal Lands; "MCF"= Major Community Facilities.

TABLE 7-9: PHASE 3 (2013) TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Phase 3 CNEL at Receiving Land Use (dBA)[2]			Noise Level Increase Significance Criteria[3]	
				Without Project	With Project	Project Increase	Criteria	Exceeded?
1	Av. 58	w/o Madison St.	LDR/MHDR/OS/GC	69.4	72.2	2.8	1.5	**Yes**
2	Av. 58	w/o Monroe St.	LDR/OS/GC	70.7	71.5	0.8	1.5	No
3	Av. 58	w/o Jackson St.	RR/MHDR/A	68.8	69.4	0.6	1.5	No
4	Madison St.	s/o Av. 56	LDR/OS/MHDR	75.2	75.8	0.6	1.5	No
5	Av. 60	w/o Jackson St.	MDR/CR/A	67.5	67.9	0.4	1.5	No
6	Av. 62	w/o Monroe St.	OS/MCF/MHDR	63.5	69.7	6.2	3.0	**Yes**
7	Av. 62	w/o Jackson St.	TL/A	68.2	69.5	1.3	1.5	No
8	Monroe St.	s/o Av. 60	LDR/MHDR/OS	70.7	72.2	1.5	1.5	**Yes**
9	Monroe St.	s/o Av. 58	GC/LDR/OS/MHDR	72.9	73.8	0.9	1.5	No
10	Monroe St.	s/o Av. 56	GC/LDR/OS	73.0	74.0	1.0	1.5	No
11	Jackson St.	s/o Airport Bl.	A/RR	69.8	70.2	0.4	1.5	No

[1] City of La Quinta General Plan Land Use Map Exhibit 11-1, Eastern Coachella Valley Area Plan Land Use Plan Figure 3.
[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 off-site transportation related noise level increase exceeding the significance criteria (Table 4-2)?
"LDR"= Low Density Residential; "GC"= General Commercial; "OS"= Open Space; "MHDR"= Medium/High Density Residential; "A"= Agriculture; "RR"= Rural Residential; "TL"= Tribal Lands; "MCF"= Major Community Facilities.

8 ON-SITE TRANSPORTATION NOISE IMPACTS

An on-site exterior noise impact analysis has been completed to determine the noise exposure levels that would result from adjacent traffic noise sources to the noise sensitive receivers located within the Project, and to identify potential noise abatement measures that would achieve acceptable Project exterior and interior noise levels. Exterior noise levels are generally limited to outdoor living areas of frequent human use (e.g., backyards of single-family homes). Interior noise levels are evaluated at the first and second floor building façade.

The primary source of traffic noise affecting the Project site is anticipated to be from Jefferson Street, North Loop and South Loop roadway segments. The Project will also experience some background traffic noise impacts from other internal streets and parking lots; however, due to the low traffic volume and low speeds of vehicles travelling on these roadways, traffic noise will not make a significant contribution to the noise environment beyond of the right-of-way of each road.

8.1 EXTERIOR NOISE ANALYSIS

Using the FHWA traffic noise prediction model and the parameters outlined in Tables 6-3 to 6-5, the expected future exterior noise levels for the on-site building were calculated. Table 8-1 presents a summary of future exterior noise levels for the planned residential development within the Travertine Specific Plan for long-range General Plan Buildout (2040) conditions. The on-site exterior traffic noise levels indicate that the single-family residential development adjacent to Jefferson Street, North Loop and South Loop will experience exterior noise levels ranging from 61.2 to 62.5 dBA CNEL. Therefore, the future on-site exterior traffic noise impacts will be *less than significant*. and no exterior noise abatement is needed to satisfy the City of La Quinta 65 dBA CNEL exterior noise level standards for the proposed land uses adjacent to Jefferson Street, North Loop or South Loop.

TABLE 8-1: EXTERIOR TRAFFIC NOISE LEVELS

Adjacent Receivers	Unmitigated Noise Level (dBA CNEL)[1]	Exterior Noise Level Threshold (dBA CNEL)[2]	Threshold Exceeded?
Jefferson Street	62.0	65	No
North Loop	61.2	65	No
South Loop	62.5	65	No

[1] On-site traffic noise calculations included in Appendix 8.1.
[2] City of La Quinta exterior noise criteria (See Section 4).

8.2 INTERIOR NOISE ANALYSIS

To ensure that the interior noise levels comply with the City of La Quinta interior noise level standards, future noise levels were calculated at the first and second floor building façade locations.

8.2.1 NOISE REDUCTION METHODOLOGY

The interior noise level is the difference between the predicted exterior noise level at the building facade and the noise reduction of the structure. Typical building construction will provide a Noise Reduction (NR) of approximately 12 dBA with "windows open" and a minimum 25 dBA noise reduction with "windows closed." (16) (4) However, sound leaks, cracks and openings within the window assembly can greatly diminish its effectiveness in reducing noise. Several methods are used to improve interior noise reduction, including: (1) weather-stripped solid core exterior doors; (2) upgraded dual glazed windows; (3) mechanical ventilation/air conditioning; and (4) exterior wall/roof assembles free of cut outs or openings.

8.2.2 INTERIOR NOISE LEVEL ASSESSMENT

Table 8-2 shows that the Project buildings will require a windows-closed condition and a means of mechanical ventilation (e.g., air conditioning). Table 8-2 shows that the future interior noise levels are expected to range from 36.2 to 37.5 dBA CNEL. The interior noise level analysis shows that the City of La Quinta 45 dBA CNEL residential interior noise standards can be satisfied using standard building construction and windows with standard STC ratings of 27 for all lots/units. Therefore, the future on-site interior traffic noise impacts will be *less than significant*.

TABLE 8-2: INTERIOR NOISE LEVELS (CNEL)

Adjacent Receivers	Noise Level at Façade[1]	Required Interior NR[2]	Minimum Estimated Interior NR[3]	Upgraded Windows[4]	Interior Noise Level[5]	Threshold	Threshold Exceeded?
Jefferson Street	62.0	17.0	25	No	37.0	45	No
North Loop	61.2	16.2	25	No	36.2	45	No
South Loop	62.5	17.5	25	No	37.5	45	No

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

9 RECEIVER LOCATIONS

To assess the potential short-term construction noise impacts, the following 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 construction noise levels, six receiver locations in the vicinity of the Project site were identified. All distances are measured from the Project site boundary to the outdoor living areas (e.g., private backyards) or at the building façade, whichever is closer to the Project site. 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. The nearest receptor where an individual can stay for a 24-hour period is represented by R5 at approximately 1,268 feet east of the Project site boundary. 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: Located approximately 4,517 feet north of the Project site, R1 represents existing residential homes on Quarry Ranch Road. A 24-hour noise level measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents existing residential homes located approximately 6,872 feet north of the Project site on Avenue 58. A 24-hour noise level measurement was taken near this location, L2, to describe the existing ambient noise environment.

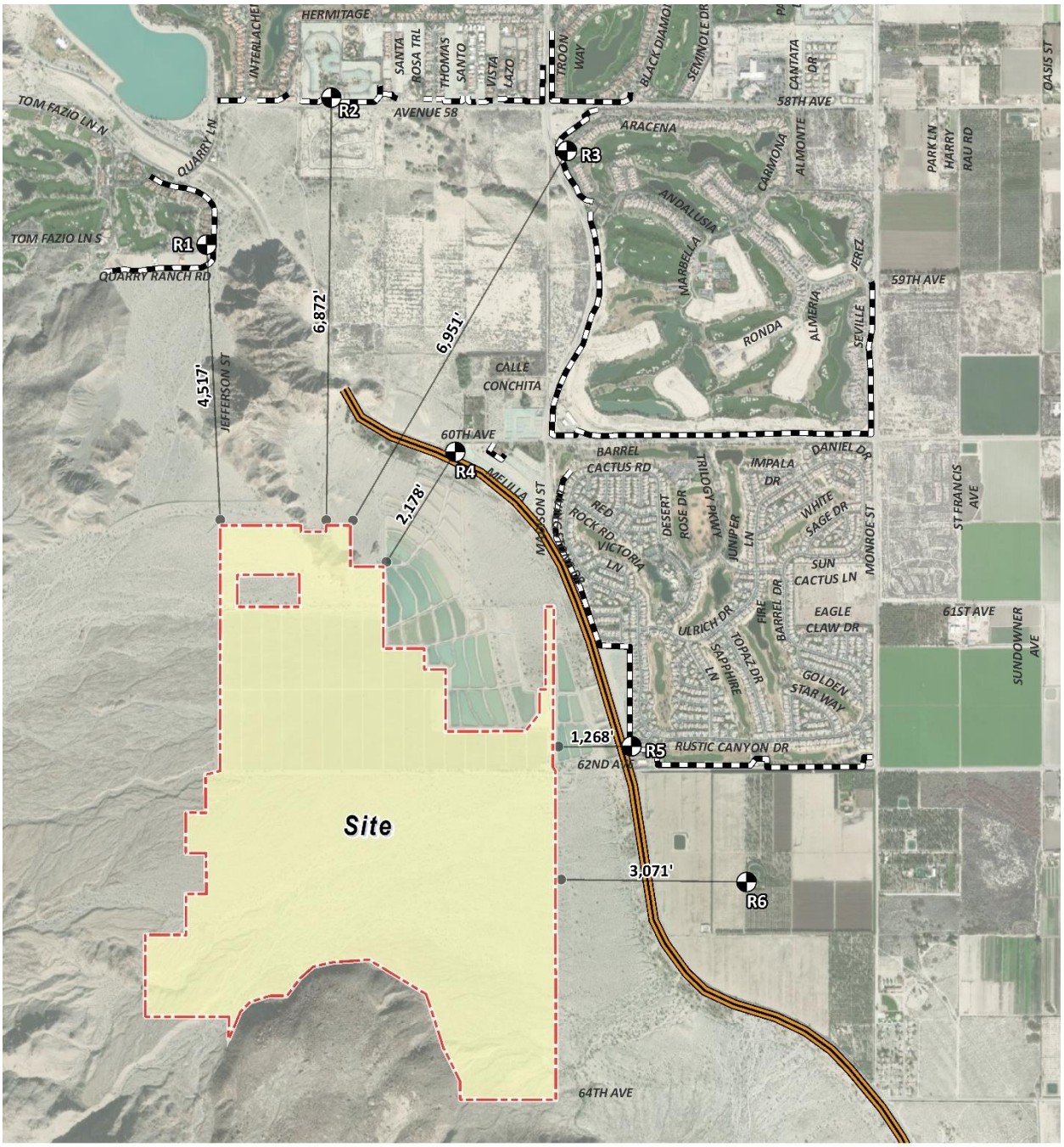
R3: Location R3 represents the existing residential homes located roughly 6,951 feet northeast of the Project site at the southeast corner of Madison Street and Avenue 58. A 24-hour noise level measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the existing residential homes located roughly 2,178 feet northeast of the Project site. A 24-hour noise level measurement was taken near this location, L8, to describe the existing ambient noise environment.

R5: Location R5 represents the existing residential community east of the Project site at roughly 1,268 feet. A 24-hour noise level measurement was taken near this location, L7, to describe the existing ambient noise environment.

R6: Location R6 represents the existing residential home and agricultural use located approximately 3,071 feet east of the Project site. A 24-hour noise level measurement was taken east of this location, L5, to describe the existing ambient noise environment.

EXHIBIT 9-A: RECEIVER LOCATIONS



10 CONSTRUCTION IMPACTS

This section analyzes potential off-site construction noise and vibration impacts associated with the development of the entire Project. Exhibit 10-A shows the construction activity boundaries in relation to the nearby off-site sensitive receiver locations.

10.1 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the proposed Project, the City has established limits to the hours of operation. The City of La Quinta Municipal Code, Section 6.08.050 indicates that construction, shall be limited to the hours of 7:00 a.m. to 5:30 p.m. Mondays to Fridays during the months of October to April, and to the hours of 6:00 a.m. to 7:00 p.m. Mondays to Fridays during the months of May to September. All year, construction activities are limited to 8:00 a.m. to 5:00 p.m. on Saturdays, with no activity allowed on Sundays. (11) However, the City's General Plan and Municipal Code do not establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes as the *generation of noise levels in excess of standards* or as a *substantial temporary or periodic noise increase*, the following construction noise level thresholds are used in this noise study. Therefore, the FTA noise level threshold of 80 dBA L_{eq} is used as a reasonable threshold to evaluate the potential Project-related construction noise level impacts at the nearby sensitive receiver locations.

10.2 CONSTRUCTION ACTIVITIES

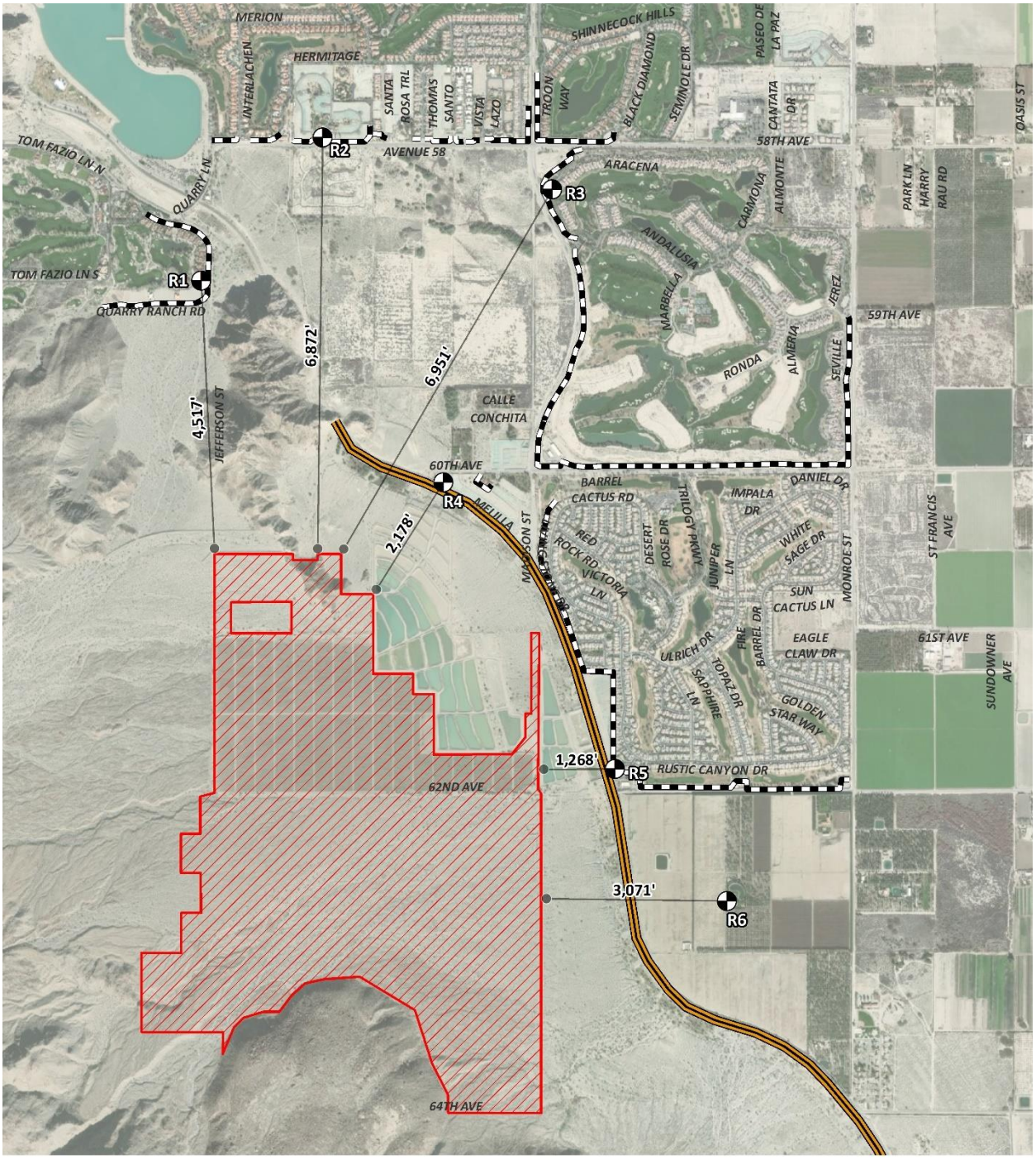
Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers, and portable generators operating simultaneously that when combined can reach high levels. The number and mix of construction equipment are expected to occur in the following stages:

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

10.3 TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of dozers, graders, scrapers, trucks, power tools, rock mixers, and portable generators. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to more than 80 dBA when measured at 50 feet.

EXHIBIT 10-A: CONSTRUCTION ACTIVITY AND RECEIVER LOCATIONS



To describe peak construction noise activities, this construction noise analysis was prepared using reference noise level measurements published in the *Update of Noise Database for Prediction of Noise on Construction and Open Sites* by the Department for Environment, Food and Rural Affairs (DEFRA). (23). The DEFRA database provides the most recent and comprehensive source of reference construction noise levels. Table 10-1 provides a summary of the DEFRA construction reference noise level measurements expressed in hourly average dBA L_{eq} using the estimated FHWA Roadway Construction Noise Model (RCNM) usage factors (24) to describe the typical construction activities for each stage of Project construction.

TABLE 10-1: TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Highest Reference Noise Level (dBA L_{eq})
Site Preparation	Crawler Tractors	77	77
	Hauling Trucks	71	
	Rubber Tired Dozers	71	
Grading	Graders	79	79
	Excavators	64	
	Compactors	67	
Building Construction	Cranes	67	72
	Tractors	72	
	Welders	65	
Paving	Pavers	70	70
	Paving Equipment	69	
	Rollers	69	
Architectural Coating	Cranes	67	67
	Air Compressors	67	
	Generator Sets	67	

[1] Update of noise database for prediction of noise on construction and open site expressed in hourly average dBA L_{eq} based on estimated usage factors from RCNM 2006.

10.4 CADNAA NOISE PREDICTION MODEL

To fully describe the Project construction noise levels, 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 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 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 (L_w) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish from 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 1.0 was used in the CadnaA noise analysis to account for soft site conditions. Appendix 9.1 includes the detailed noise model inputs used to estimate the Project construction noise levels presented in this section.

10.5 OFF-SITE 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 nearby off-site sensitive receiver locations were completed. To assess the worst-case construction noise levels, the Project construction noise analysis relies on the highest noise level impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity (Project site boundary) to each of the off-site receiver location. As shown on Table 10-2, the construction noise levels are expected to range from 28.9 to 58.7 dBA L_{eq}, and the highest construction levels are expected to range from 40.9 to 58.7 dBA L_{eq} at the nearby off-site receiver locations.

TABLE 10-2: OFF-SITE 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	38.9	40.9	33.9	31.9	28.9	40.9
R2	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]
R3	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]
R4	52.5	54.5	47.5	45.5	42.5	54.5
R5	56.7	58.7	51.7	49.7	46.7	58.7
R6	52.2	54.2	47.2	45.2	42.2	54.2

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Construction noise level calculations based on distance from the project site boundaries (construction activity area) to nearby receiver locations. CadnaA construction noise model inputs are included in Appendix 10.1.
[3] Existing topography blocks direct exposure to this receiver location.

The construction noise analysis presents a conservative approach with the highest noise-level-producing equipment for each stage of Project construction operating at the perimeter of the Project site to the nearby sensitive receiver locations. This scenario is unlikely to occur during typical construction activities and likely overstates the construction noise levels which will be experienced at each receiver location.

10.6 OFF-SITE CONSTRUCTION NOISE LEVEL COMPLIANCE

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 off-site receiver locations will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities as shown on Table 10-3. Therefore, the noise impacts due to Project construction noise are considered *less than significant* at all off-site receiver locations.

TABLE 10-3: OFF-SITE CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	40.9	80	No
R2	-[5]	80	No
R3	-[5]	80	No
R4	54.5	80	No
R5	58.7	80	No
R6	54.2	80	No

[1] Noise receiver locations are shown on Exhibit 9-A.
[2] Highest construction noise level operating at the Project site boundary to nearby receiver locations (Table 9-2).
[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?
[5] Existing topography blocks direct exposure to this receiver location.

10.7 ROCK CRUSHING REFERENCE NOISE LEVELS

An additional analysis was completed to assess the off-site construction noise level impacts due to rock crushing activities during grading activity. No blasting is anticipated on the site. Based on information provided by the Project Applicant, the Project will be graded in two phases (Phase A and B) before Project infrastructure construction begins and is expected to balance. The crushed rock will not be exported off-site and therefore no export activities are anticipated. The type of crusher will be a mobile unit, anticipated to consist of Sandvik QJ331, Anaconda TD516, or similar.

The rock crushing construction noise analysis was prepared using reference construction equipment noise levels from the RCNM (25). Table 10-4 provides a summary of the reference average L_{eq} noise levels used to describe rock crushing construction activities that include a hoe ram or breaker representing a percussion hammer fitted to an excavator for breaking rock.

TABLE 10-4: ROCK CRUSHING REFERENCE NOISE LEVELS

Construction Stage	Typical Equipment	Reference Noise Level @ 50 Feet (dBA L_{eq})[1]	Highest Reference Noise Level (dBA L_{eq})
Rock Crushing	Impact Hammer (hoe ram)	83	83
	Front End Loader	75	
	Dump Truck	72	

[1] FHWA's Roadway Construction Noise Model, January 2006.

10.8 ROCK CRUSHING CONSTRUCTION NOISE ANALYSIS AND COMPLIANCE

Using the reference RCNM construction equipment noise levels shown on Table 10-4 and the CadnaA noise prediction model, calculations of the rock crushing activity operating at the Project site boundary to each off-site receiver location were completed. As shown on Table 10-5, the unmitigated rock crushing noise levels are expected to range from 44.9 to 62.7 dBA L_{eq}. The construction noise analysis shows that the rock crushing activities will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold at the nearest off-site receiver locations. Therefore, the noise impacts due to Project rock crushing noise are considered *less than significant* at all off-site receiver locations. Appendix 10.2 includes the rock crushing CadnaA noise model calculations.

TABLE 10-5: ROCK CRUSHING NOISE LEVEL SUMMARY

Receiver Location[1]	Rock Crushing Construction Noise Levels (dBA L_{eq})		
	Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	44.9	80	No
R2	-[5]	80	No
R3	-[5]	80	No
R4	58.5	80	No
R5	62.7	80	No
R6	58.2	80	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise level operating at the Project site boundary.
based on distance from the construction noise source activity to nearby receiver locations as shown on Table 10-2.
[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?
[5] Existing topography blocks direct exposure to this receiver location.

10.9 WATER WELL CONSTRUCTION

In addition to the on-site crushing activity, the Project will also create off-site water well construction noise level impacts. According to the applicant, the off-site water wells will be limited to the confined aquifer and not within 1,000 feet of any existing CVWD well site. According to the FHWA Road Construction Noise Model, reference noise level measurements suggest that well drilling construction noise levels approach 78 dBA L_{eq} at 50 feet. (24) Since the actual location of the off-site water well construction sites and potentially impacted nearby noise sensitive receivers are not known at this time, temporary noise barriers shall be required. Prior to water well drilling, the construction site shall provide a temporary 24-foot-high noise barrier. Appendix 10.3 includes photos of the planned typical temporary 24-foot-high noise barrier used throughout the water well construction activity. The peak off-site water well construction noise levels with the planned temporary 24-foot-high noise barrier at 50 feet are expected to satisfy the reasonable daytime exterior construction noise threshold of 80 dBA L_{eq} during temporary Project construction activities.

10.10 OFF-SITE SUBSTATION

Electric service to Travertine will be provided by Imperial Irrigation District (IID). An offsite substation will be required for the Travertine development and will be located and constructed during Construction Phase I. The location of the five-acre site will be within a two-mile radius of the project. The actual location of the substation and potentially impacted nearby noise sensitive receivers are not known at this time. However, all substation construction noise levels shall satisfy the reasonable daytime exterior noise threshold of 80 dBA L_{eq} during temporary Project construction activities.

10.11 OFF-SITE CONSTRUCTION NOISE LEVEL INCREASES

To describe the off-site Project construction noise level contributions to the existing ambient noise environment, the Project construction noise levels were combined with the existing ambient noise levels measurements at the off-site receiver locations. The difference between the combined Project-construction and ambient noise levels are used to describe the construction noise level contributions. Temporary noise level increases that would be experienced at sensitive receiver locations when Project construction-source noise is added to the ambient daytime conditions are presented on Table 10-6. A temporary noise level increase of 12 dBA is considered a potentially significant impact based on the Caltrans substantial noise level increase criteria which is used to assess the Project-construction noise level increases. (16) No nighttime construction activity is permitted in the City of La Quinta Municipal Code, and therefore, nighttime noise level increases are not analyzed in this noise study.

As indicated in Table 10-6, the Project will contribute unmitigated, typical construction noise level increases at nearby sensitive residential homes of up to 11.6 dBA L_{eq} during the daytime hours. Since the highest temporary noise level increase of up to 11.6 dBA L_{eq} during Project construction will satisfy the 12 dBA L_{eq} significance threshold, the unmitigated construction noise level increases are considered *less than significant* temporary noise impacts.

TABLE 10-6: OFF-SITE CONSTRUCTION-RELATED TEMPORARY 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]	Typical Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	40.9	L1	59.8	59.9	0.1	12	No
R2	-[3]	L2	57.7	57.7	0.0	12	No
R3	-[3]	L3	54.8	54.8	0.0	12	No
R4	54.5	L8	53.2	56.9	3.7	12	No
R5	58.7	L7	49.8	59.2	9.4	12	No
R6	54.2	L5	42.9	54.5	11.6	12	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise level operating at the Project site boundary as shown on Table 10-2.
[3] Ambient 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 highest construction activities.
[6] The temporary typical construction noise level increase expected with the addition of the highest construction activities.
[7] Based on the 12 dBA temporary increase significance criteria as outlined in Section 4.

10.12 ON-SITE CONSTRUCTION NOISE ANALYSIS

Due to the phased nature of the Project development, future phases have the potential to generate construction noise level impacts to previous phases of development. The project grading will take place in two phases. Phase A will grade the southern half of the project and Phase B grading will grade the northern half of the project. Phase B grading will impact the on-site noise sensitive residential land uses planned in Phase 1A as shown on Exhibit 10-B. To assess the potential Phase B grading construction noise source activity, receiver locations were identified within in each of the Phase 1A Planning Areas to describe the on-site construction noise level impacts.

Table 10-7 shows that the highest construction Phase B on-site Project grading construction of noise levels are expected to range from 68.0 to 72.5 dBA L_{eq} and will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold. Therefore, the noise impacts due to the Phase B grading construction noise source activities are considered *less than significant* at all the nearest on-site receiver locations.

EXHIBIT 10-B: ON-SITE PROJECT PHASE B GRADING CONSTRUCTION NOISE SOURCE ACTIVITY

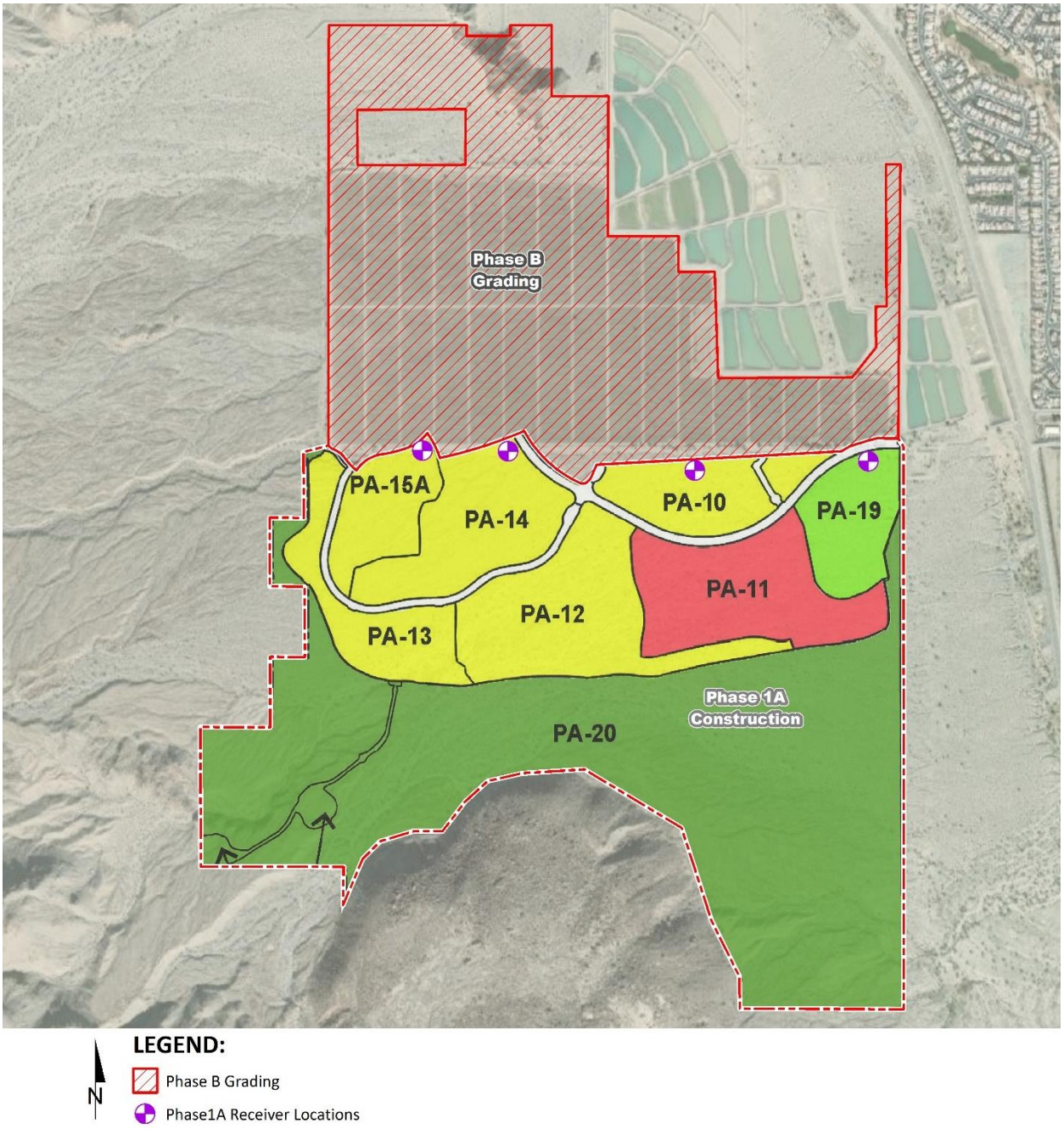


TABLE 10-7: PHASE B GRADING ON-SITE NOISE LEVEL COMPLIANCE

On-Site Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
PA-15A	72.5	80	No
PA-14	71.7	80	No
PA-10	71.2	80	No
PA-19	68.0	80	No

[1] Noise receiver locations are shown on Exhibit 10-B.
[2] Highest construction noise level operating at the Project site boundary to nearby receiver locations.
[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?

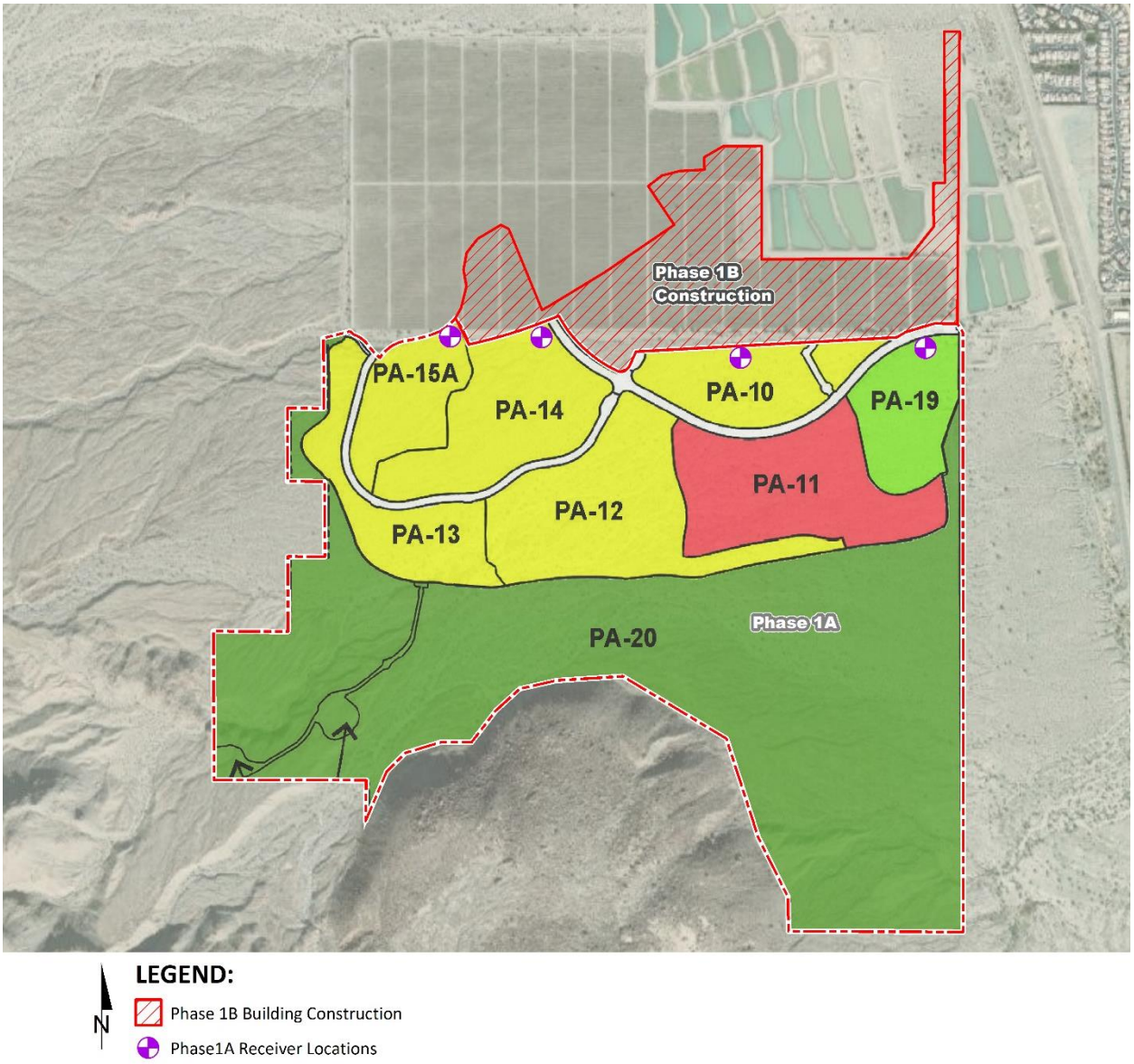
Phase 1B building construction activities will impact the on-site noise sensitive residential land uses planned in Phase 1A as shown on Exhibit 10-C. To assess the potential Phase 1B building construction noise source activity, receiver locations were identified within in each of the Phase 1A Planning Areas. Using the highest building construction noise source level of 72 dBA $L_{eq,}$ Table 10-8 shows that the Phase 1A noise levels are expected to range from 61.0 to 65.5 dBA L_{eq} due to the Phase 1B building construction source activities and will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold. Therefore, the noise impacts due to the Phase 1B building construction noise source activities are considered *less than significant* at all the nearest on-site receiver locations.

TABLE 10-8: PHASE 1B BUILDING CONSTRUCTION ON-SITE NOISE LEVEL COMPLIANCE

On-Site Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
PA-15A	65.5	80	No
PA-14	64.7	80	No
PA-10	64.2	80	No
PA-19	61.0	80	No

[1] Noise receiver locations are shown on Exhibit 10-C.
[2] Highest construction noise level operating at the Project site boundary to nearby receiver locations.
[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?

EXHIBIT 10-C: ON-SITE PROJECT PHASE 1B BUILDING CONSTRUCTION NOISE SOURCE ACTIVITY



Phase 2 building construction activities will impact the on-site noise sensitive residential land uses planned in Phase 1B as shown on Exhibit 10-D. To assess the potential Phase 2 building construction noise source activity, receiver locations were identified within in each of the Phase 1B Planning Areas. Using the highest building construction noise source level of 72 dBA $L_{eq,}$ Table 10-9 shows that the Phase 1B noise levels are expected to range from 62.6 to 65.9 dBA L_{eq} due to the Phase 2 building construction source activities and will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold. Therefore, the noise impacts due to the Phase 2 building construction noise source activities are considered *less than significant* at all the nearest on-site receiver locations.

EXHIBIT 10-D: ON-SITE PROJECT PHASE 2 BUILDING CONSTRUCTION NOISE SOURCE ACTIVITY

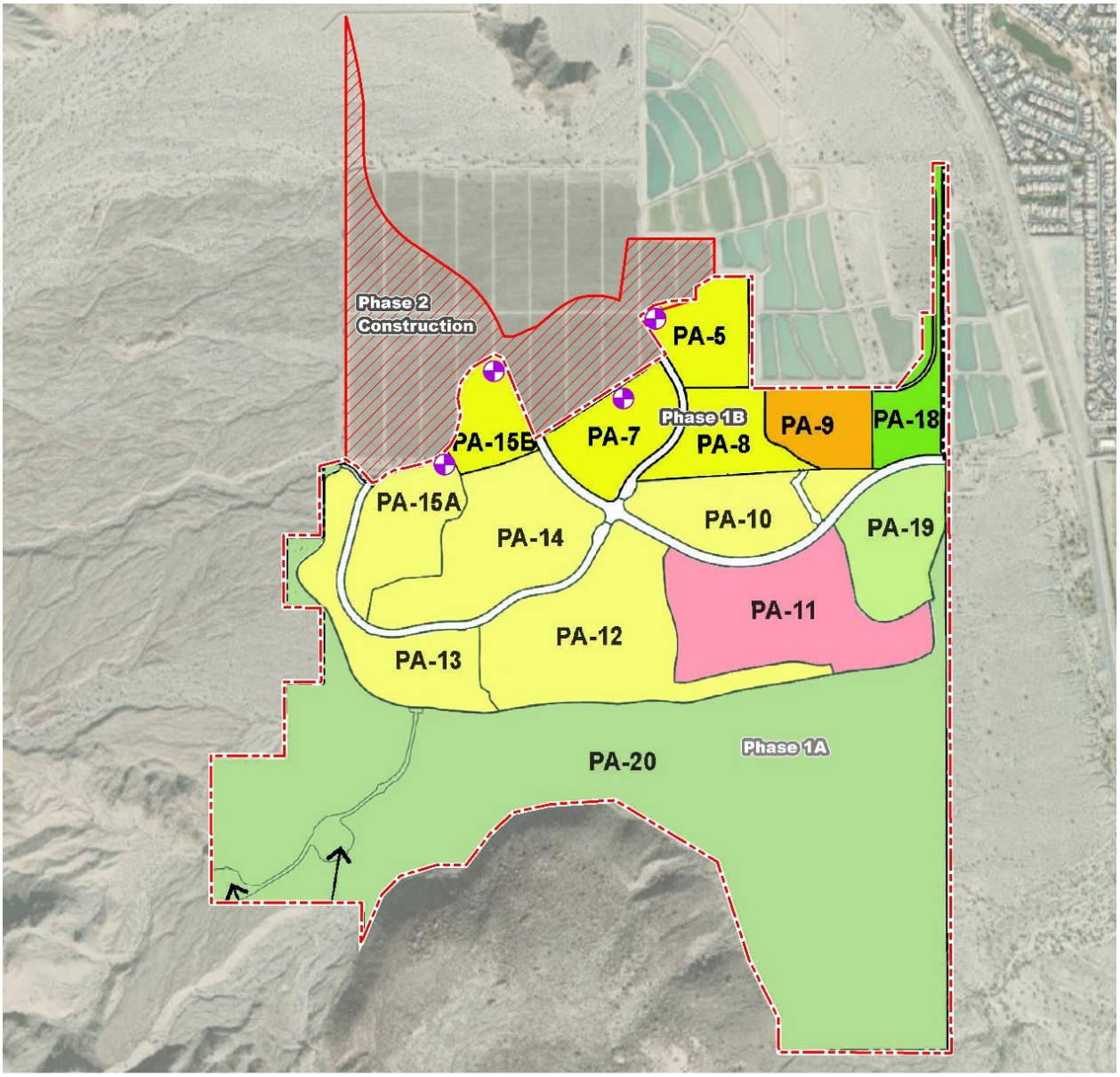


TABLE 10-9: PHASE 2 BUILDING CONSTRUCTION ON-SITE NOISE LEVEL COMPLIANCE

On-Site Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
PA-15A	63.2	80	No
PA-15B	65.2	80	No
PA-7	62.6	80	No
PA-5	65.9	80	No

[1] Noise receiver locations are shown on Exhibit 10-D.
[2] Highest construction noise level operating at the Project site boundary to nearby receiver locations.
[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?

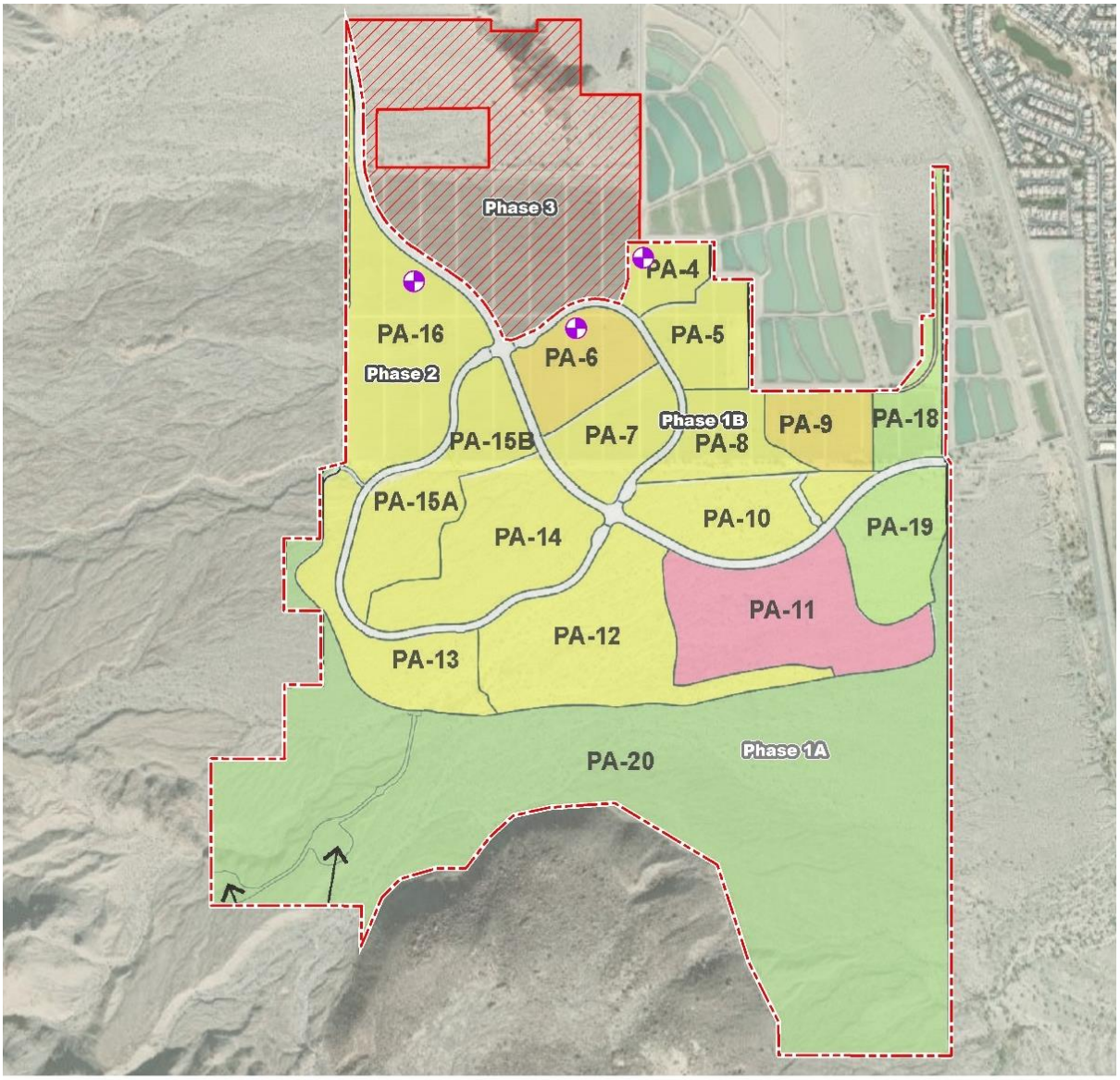
Phase 3 building construction activities will impact the on-site noise sensitive residential land uses planned in Phase 2 as shown on Exhibit 10-E. To assess the potential Phase 3 building construction noise source activity, receiver locations were identified within in each of the Phase 2 Planning Areas. Using the highest building construction noise source level of 72 dBA $L_{eq,}$ Table 9-10 shows that the Phase 2 noise levels are expected to range from 61.0 to 63.0 dBA L_{eq} due to the Phase 3 building construction source activities and will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold. Therefore, the noise impacts due to the Phase 3 building construction noise source activities are considered *less than significant* at all the nearest on-site receiver locations.

TABLE 10-10: PHASE 3 BUILDING CONSTRUCTION ON-SITE NOISE LEVEL COMPLIANCE

On-Site Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
PA-16	61.0	80	No
PA-6	61.7	80	No
PA-4	63.0	80	No

[1] Noise receiver locations are shown on Exhibit 10-E.
[2] Highest construction noise level operating at the Project site boundary to nearby receiver locations.
[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?

EXHIBIT 10-E: ON-SITE PROJECT PHASE 3 BUILDING CONSTRUCTION NOISE SOURCE ACTIVITY



10.13 OFF-SITE CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. Ground-borne vibration levels resulting from typical construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration (FTA). (8) However, while vehicular traffic is rarely perceptible, construction has

the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 9-11. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential Project construction vibration levels using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 10-11: 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
Hoe Ram (Breaker)	0.089

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Using the vibration source level of construction equipment provided on Table 10-11 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-12 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 1,268 to 6,9518 feet from Project construction activities, construction vibration velocity levels are estimated to range from 0.0000 to 0.0002 in/sec RMS and will remain below the City of La Quinta threshold of 0.01 in/sec RMS at all receiver locations, as shown on Table 10-12. The analysis shows that at 90 feet from the construction vibration source activities, receivers would experience vibration velocity level of 0.0093 in/sec RMS. Therefore, vibration levels are considered *less than significant* any receiver located at distances of greater than 90 from construction equipment.

Further, the levels at the site of the closest sensitive receivers are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter. Construction at the Project site will be restricted to daytime hours consistent with City requirements thereby eliminating potential vibration impact during the sensitive nighttime hours.

TABLE 10-12: OFF-SITE CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)	Receiver RMS Levels (in/sec)[2]						Threshold Exceeded?[3]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Hoe Ram	Peak Vibration	
R1	4,517'	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	No
R2	6,872'	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	No
R3	6,951'	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	No
R4	2,178'	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	No
R5	1,268'	0.0000	0.0001	0.0001	0.0002	0.0002	0.0002	No
R6	3,071'	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	No

[1] Receiver locations are shown on Exhibit 9-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 9-7. Vibration levels in PPV are converted to RMS velocity using a 0.71 conversion factor identified in the Caltrans Transportation and Construction Vibration Guidance Manual, April 2020.
[3] Does the peak vibration exceed the maximum acceptable vibration threshold shown on Table 4-2?

10.14 CONSTRUCTION NOISE AND VIBRATION ABATEMENT MEASURES

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

- Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that noise-generating Project construction activities shall only occur between the hours of 7:00 a.m. to 5:30 p.m. Mondays to Fridays during the months of October to April, and to the hours of 6:00 a.m. to 7:00 p.m. Mondays to Fridays during the months of May to September. All year, construction activities are limited to 8:00 a.m. to 5:00 p.m. on Saturdays, with no activity allowed on Sundays. (11) The Project construction supervisor shall ensure compliance with the note and the City shall conduct periodic inspection at its discretion.
- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the west).
- The construction contractor shall limit construction haul truck deliveries to the same hours specified for construction equipment (between the hours of 7:00 a.m. to 5:30 p.m. Mondays to Fridays during the months of October to April, and to the hours of 6:00 a.m. to 7:00 p.m. Mondays to Fridays during the months of May to September. All year, construction activities are limited to 8:00 a.m. to 5:00 p.m. on Saturdays, with no activity allowed on Sundays (11)). The contractor shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Environmental Checklist Form Appendix G.* 2019.
2. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
3. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
4. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
5. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
6. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
7. **Occupational Safety and Health Administration.** *Standard 29 CRF, Part 1910.*
8. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
9. **Office of Planning and Research.** *State of California General Plan Guidelines.* 2018.
10. **City of La Quinta.** *General Plan Environmental Hazards Element, Noise.* December 2013.
11. —. *Municipal Code, Sections 9.100, 6.08.*
12. **County of Riverside.** *General Plan Noise Element.* December 2015.
13. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
14. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
15. **Superior Court of California, County of Riverside.** *Friends of Riverside's Hills v. Riverside Transportation Commission, et al.* RIC 1113896, January 2013.
16. **California Department of Transportation.** *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects.* May 2011.
17. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
18. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
19. **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.
20. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.

21. **Urban Crossroads, Inc.** *Travertine Specific Plan Traffic Impact Analysis.* September 2021.

22. **California Department of Transportation.** *Traffic Noise Analysis Protocol.* May 2011.

23. **Department of Environment, Food and Rural Affiars (Defra).** *Update of Noise Database for Prediction of Noise on Construction and Open Sites.* 2004.

24. **FHWA.** *Roadway Construction Noise Model.* January 2006.

25. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning.** *FHWA Roadway Construction Noise Model.* January, 2006.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Travertine Specific Plan Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 584-3148.

Bill Lawson, P.E., INCE
Principal
URBAN CROSSROADS, INC.
1133 Camelback #8329
Newport Beach, CA 92658
(949) 581-3148
blawson@urbanxroads.com

EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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

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APPENDIX 3.1:

CITY OF LA QUINTA MUNICIPAL CODE

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6.08.050 Disturbances by construction noises.

A. It is a nuisance and it is unlawful, for any person to be engaged or employed, or for any person to cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition to, or improvement to realty, except between the hours set forth as follows:

October 1st through April 30th	Monday—Friday:	seven a.m. to five-thirty p.m.
	Saturday:	eight a.m. to five p.m.
	Sunday:	none
	Holidays*:	none
May 1st through September 30th	Monday—Friday:	six a.m. to seven p.m.
	Saturday:	eight a.m. to five p.m.
	Sunday:	none
	Holidays*:	none

* For purposes of this section, the following shall be considered Holidays:

New Year's Day (January 1st)
Dr. Martin Luther King Jr. Day (third Monday in January)
President's Day (third Monday in February formerly Washington's birthday)
Memorial Day (last Monday in May)
Independence Day (July 4th)
Labor Day (first Monday in September)
Veteran's Day (November 11th)
Thanksgiving (fourth Thursday in November)
Christmas Day (December 25th)

B. No person doing or causing work prohibited by subsection A of this section, after being informed orally or in writing that the work is in violation of subsection A, shall fail, refuse or neglect to cease said work.

Exceptions:

1. Emergency repair of existing installations or equipment or appliances;

2. Construction work complying with the terms of a written early work permit which may be issued by the city manager or designee, upon a showing of sufficient need due to hot or inclement weather, or the use of an unusually long process material, or other circumstances of unusual and compelling nature. (Ord. 393 § 1, 2003; Ord. 18 § 1, 1982)

View the mobile version.

9.100.210 Noise control.

A. Purpose. The noise control standards for nonresidential land use districts set forth in this section are established to prevent excessive sound levels which are detrimental to the public health, welfare and safety or which are contrary to the public interest.

B. Noise Standards. Exterior noise standards are set forth below. Residential property, schools, hospitals, and churches are considered noise sensitive land uses, regardless of the land use district in which they are located. All other uses shall comply with the "other nonresidential" standard. All noise measurements shall be taken using standard noise measuring instruments. Measurements shall be taken within the receiving property at locations determined by director to be most appropriate to the individual situation.

Land Use Compatibility for Community Noise Environments

Land Uses	CNEL (dBA)						
	50	55	60	65	70	75	80
Residential – Single Family Dwellings, Duplex, Mobile Homes	A						
		B					
					C		
						D	
Residential – Multiple Family		A					
			B				
					C		
						D	
Transient Lodging: Hotels and Motels	A						
			B				
					C		
							D
School Classrooms, Libraries, Churches, Hospitals, Nursing Homes and Convalescent Hospitals	A						
			B				
					C		
							D
Auditoriums, Concert Halls, Amphitheaters							
	B						
				C			
Sports Arenas, Outdoor Spectator Sports							
	B						
					C		
Playgrounds, Neighborhood Parks	A						
					C		
						D	
Golf Courses, Riding Stables, Water Recreation, Cemeteries	A						
					C		
							D
Office Buildings, Business, Commercial and Professional	A						
					B		
						D	
Industrial, Manufacturing, Utilities, Agriculture	A						
					B		
						D	

Source: California Department of Health Services, "Guidelines for the Preparation and Content of the Noise Element of the General Plan," 1990.

A Normally Acceptable: With no special noise reduction requirements assuming standard construction.

B Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design.

C Normally Unacceptable: New construction is discouraged. If new construction does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

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

Exterior Noise Standards

Receiving Land Use	Noise Standard	Time Period
Noise sensitive	65 dB(A) 50 dB(A)	7:00 a.m.—10:00 p.m. 10:00 p.m.—7:00 a.m.
Other nonresidential	75 dB(A) 65 dB(A)	7:00 a.m.—10:00 p.m. 10:00 p.m.—7:00 a.m.

If the noise consists entirely of impact noise, simple tone noise, speech or music, or any combination thereof, each of the noise levels specified in the table in this section shall be reduced by five dB(A).

C. Noise Limits. It is unlawful for any person at any location within the city to create any noise, or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, when such noise causes the noise level, when measured on any adjacent property, to exceed:

1. The noise standard for a cumulative period of more than thirty minutes in any hour;

2. The noise standard plus five dB(A) for a cumulative period of more than fifteen minutes in any hour;
3. The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour;
4. The noise standard plus fifteen dB(A) for a cumulative period of more than one minute in any hour; or
5. The noise standard plus twenty dB(A) for any period of time.
6. For purposes of this section, the term “cumulative period” means the number of minutes that a noise occurs within any hour, whether such minutes are consecutive or not.

D. Ambient Noise Level. If the ambient or background noise level exceeds any of the preceding noise categories, no increase above such ambient noise level shall be permitted.

E. Exemptions. The following are exempt from the noise restrictions of this section:

1. Emergency vehicles or other emergency operations.
2. City maintenance, construction or similar activities.
3. Construction activities regulated by Section 6.08.050 of the La Quinta Municipal Code.

F. Enforcement. The city building official shall have the responsibility and authority to enforce the provisions of this section. (Ord. 550 § 1, 2016)

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APPENDIX 5.1:

STUDY AREA PHOTOS

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L1_E
33, 37' 26.880000", 116, 16' 12.180000"

L1_N
33, 37' 26.880000", 116, 16' 12.180000"

L1_S
33, 37' 26.860000", 116, 16' 12.260000"

L1_W
33, 37' 26.880000", 116, 16' 12.180000"

L2_E
33, 37' 39.710000", 116, 15' 46.060000"

L2_N
33, 37' 39.590000", 116, 15' 46.010000"

L2_S
33, 37' 39.760000", 116, 15' 45.980000"

L2_W
33, 37' 39.700000", 116, 15' 46.010000"

L3_E
33, 37' 37.500000", 116, 15' 1.510000"

L3_S
33, 37' 37.500000", 116, 15' 1.510000"

L3_W
33, 37' 37.510000", 116, 15' 1.510000"

L4_E
33, 36' 44.980000", 116, 13' 59.790000"

L4_N
33, 36' 44.790000", 116, 13' 59.900000"

L4_S
33, 36' 44.910000", 116, 13' 59.740000"

L4_W
33, 36' 44.980000", 116, 13' 59.790000"

L5_N
33, 35' 43.900000", 116, 14' 0.480000"

L5_S
33, 35' 43.900000", 116, 14' 0.480000"

L5_W
33, 35' 44.010000", 116, 14' 0.560000"

L6_E
33, 35' 16.230000", 116, 14' 0.150000"

L6_N
33, 35' 16.280000", 116, 14' 0.100000"

L6_S
33, 35' 16.160000", 116, 14' 0.340000"

L6_W
33, 35' 16.340000", 116, 14' 0.070000"

L7_E
33, 35' 53.980000", 116, 14' 39.430000"

L7_N
33, 35' 53.990000", 116, 14' 39.430000"

L7_S
33, 35' 53.950000", 116, 14' 39.430000"

L7_W
33, 35' 54.020000", 116, 14' 39.460000"

L8_E
33, 36' 45.600000", 116, 15' 6.650000"

L8_N
33, 36' 45.560000", 116, 15' 6.650000"

L8_NE
33, 36' 45.730000", 116, 15' 6.450000"

L8_S
33, 36' 45.620000", 116, 15' 6.670000"

L8_W
33, 36' 45.620000", 116, 15' 6.650000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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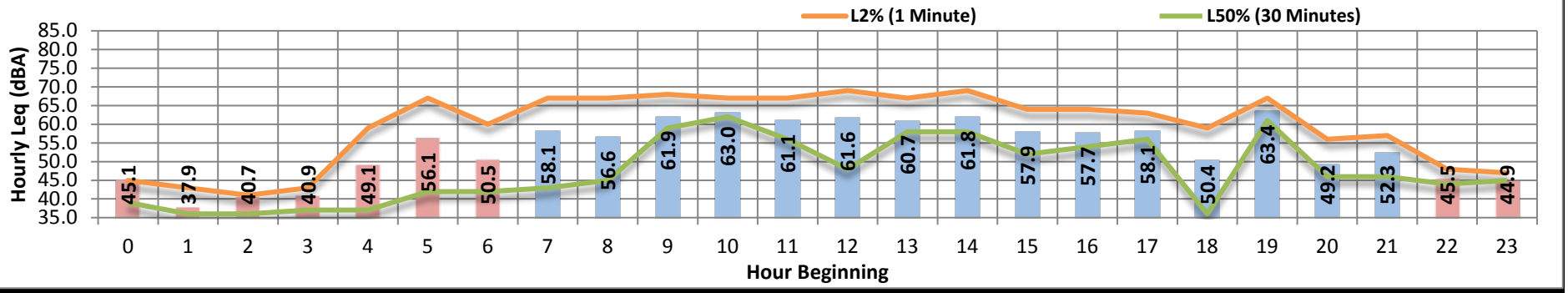
24-Hour Noise Level Measurement Summary

			Energy Average Leq		24-Hour
Project Name:	Travertine	*JN:* 10780	*Day*	*Night*	*CNEL*
Location:	L1- Located on Quary Ranch Road north of the Project site near existing residential homes.	*Analyst:* A. Wolfe	59.8	49.1	60.5
		Date: 8/16/2017			

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	49.2	69.2	36.0	59.0	56.0	52.0	49.0	40.0	36.0	36.0	36.0	36.0
	Max	63.4	85.7	45.9	72.0	69.0	67.0	67.0	66.0	62.0	55.0	50.0	47.0
Energy Average:		59.8	Average:		66.7	64.7	62.2	61.1	56.2	52.0	41.8	40.5	39.1
Night	Min	37.9	58.6	36.0	43.0	41.0	40.0	39.0	36.0	36.0	36.0	36.0	36.0
	Max	56.1	76.6	40.7	69.0	67.0	63.0	60.0	46.0	45.0	43.0	43.0	41.0
Energy Average:		49.1	Average:		52.6	50.3	46.6	44.8	41.3	39.8	37.6	37.4	36.9
Hourly Summary													
Night	0	45.1	71.8	36.0	48.0	45.0	43.0	42.0	40.0	39.0	36.0	36.0	36.0
	1	37.9	58.6	36.0	43.0	43.0	41.0	39.0	36.0	36.0	36.0	36.0	36.0
	2	40.7	72.5	36.0	43.0	41.0	40.0	39.0	38.0	36.0	36.0	36.0	36.0
	3	40.9	64.3	36.0	45.0	43.0	40.0	39.0	39.0	37.0	36.0	36.0	36.0
	4	49.1	73.9	36.0	63.0	59.0	48.0	44.0	39.0	37.0	36.0	36.0	36.0
	5	56.1	76.6	36.0	69.0	67.0	63.0	60.0	46.0	42.0	39.0	38.0	36.0
	6	50.5	73.1	39.0	64.0	60.0	51.0	48.0	44.0	42.0	40.0	40.0	39.0
Day	7	58.1	82.4	39.0	70.0	67.0	60.0	56.0	45.0	43.0	40.0	40.0	39.0
	8	56.6	77.0	39.6	69.0	67.0	62.0	59.0	49.0	45.0	42.0	41.0	40.0
	9	61.9	74.9	42.5	69.0	68.0	66.0	65.0	64.0	59.0	44.0	43.0	43.0
	10	63.0	77.9	40.8	69.0	67.0	66.0	66.0	64.0	62.0	55.0	50.0	42.0
	11	61.1	85.7	39.0	70.0	67.0	65.0	64.0	60.0	56.0	42.0	40.0	39.0
	12	61.6	84.0	36.0	72.0	69.0	65.0	65.0	61.0	48.0	39.0	38.0	36.0
	13	60.7	76.1	42.0	69.0	67.0	64.0	64.0	62.0	58.0	47.0	45.0	43.0
	14	61.8	83.4	45.9	71.0	69.0	65.0	64.0	61.0	58.0	49.0	49.0	47.0
	15	57.9	79.7	36.0	66.0	64.0	63.0	62.0	58.0	52.0	36.0	36.0	36.0
	16	57.7	75.0	36.0	66.0	64.0	62.0	62.0	58.0	54.0	39.0	36.0	36.0
	17	58.1	74.7	36.0	64.0	63.0	62.0	61.0	59.0	56.0	36.0	36.0	36.0
	18	50.4	69.7	36.0	60.0	59.0	58.0	57.0	40.0	36.0	36.0	36.0	36.0
	19	63.4	72.5	36.0	67.0	67.0	67.0	67.0	66.0	61.0	36.0	36.0	36.0
	20	49.2	69.2	36.0	60.0	56.0	52.0	49.0	46.0	46.0	42.0	40.0	36.0
	21	52.3	74.8	40.6	59.0	57.0	56.0	56.0	50.0	46.0	44.0	42.0	41.0
Night	22	45.5	60.7	40.7	50.0	48.0	47.0	46.0	45.0	44.0	43.0	43.0	41.0
	23	44.9	59.4	36.0	48.0	47.0	46.0	46.0	45.0	45.0	36.0	36.0	36.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name: Travertine

Location: L2- Located on Avenue 58 north of the Project site near existing residential homes.

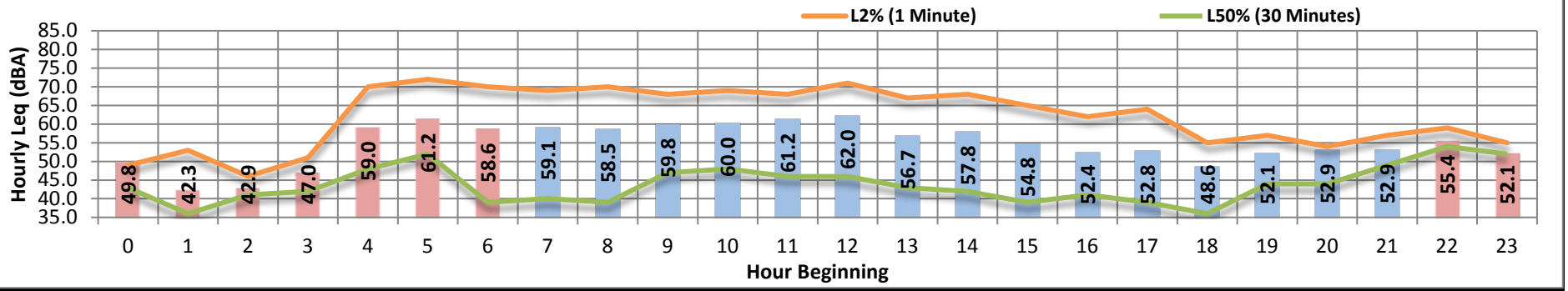
JN: 10780

Analyst: A. Wolfe

Date: 8/16/2017

Energy Average Leq		*24-Hour*
Day	*Night*	*CNEL*
57.7	55.9	62.8

Hourly Leq dBA Readings (unadjusted)



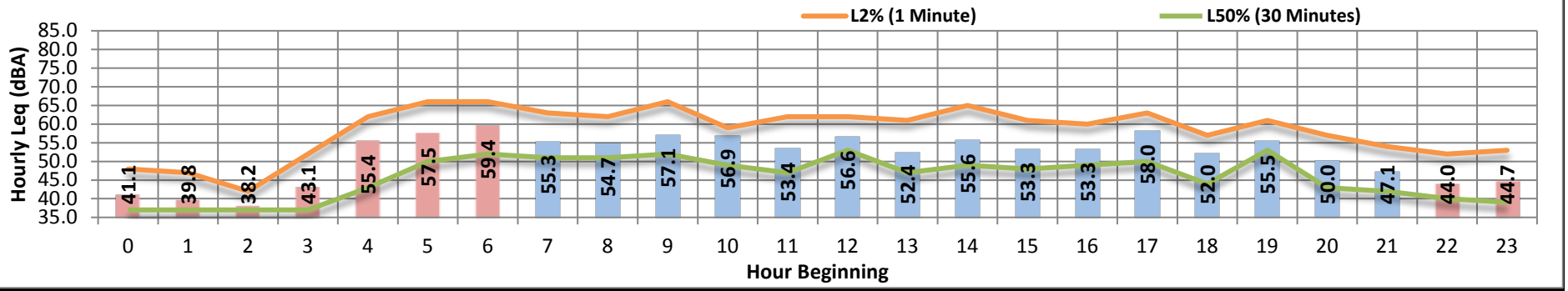
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	48.6	74.0	36.4	59.0	54.0	45.0	43.0	41.0	36.0	36.0	36.0	36.0
	Max	62.0	89.0	39.4	73.0	71.0	67.0	66.0	61.0	49.0	45.0	44.0	42.0
Energy Average:		57.7	Average:		67.8	64.3	59.1	56.2	49.3	42.9	37.5	37.3	36.6
Night	Min	42.3	57.6	36.4	48.0	46.0	43.0	39.0	36.0	36.0	36.0	36.0	36.0
	Max	61.2	81.6	48.4	74.0	72.0	67.0	63.0	57.0	54.0	51.0	50.0	50.0
Energy Average:		55.9	Average:		59.7	58.3	55.2	52.9	48.2	45.2	40.1	39.4	38.6
Hourly Summary													
Night	0	49.8	78.9	36.4	52.0	49.0	48.0	47.0	46.0	43.0	36.0	36.0	36.0
	1	42.3	65.6	36.4	54.0	53.0	43.0	39.0	36.0	36.0	36.0	36.0	36.0
	2	42.9	57.6	36.4	48.0	46.0	46.0	45.0	44.0	41.0	36.0	36.0	36.0
	3	47.0	70.3	36.4	51.0	51.0	50.0	50.0	48.0	42.0	36.0	36.0	36.0
	4	59.0	80.5	36.4	71.0	70.0	66.0	62.0	52.0	48.0	39.0	37.0	36.0
	5	61.2	81.6	48.4	74.0	72.0	67.0	63.0	53.0	52.0	51.0	50.0	50.0
	6	58.6	78.3	36.4	73.0	70.0	64.0	58.0	45.0	39.0	36.0	36.0	36.0
Day	7	59.1	84.5	36.4	72.0	69.0	62.0	57.0	46.0	40.0	36.0	36.0	36.0
	8	58.5	80.5	36.4	72.0	70.0	64.0	58.0	43.0	39.0	36.0	36.0	36.0
	9	59.8	76.4	36.4	70.0	68.0	64.0	63.0	61.0	47.0	36.0	36.0	36.0
	10	60.0	79.7	36.4	71.0	69.0	64.0	63.0	60.0	48.0	41.0	39.0	36.0
	11	61.2	83.8	36.4	71.0	68.0	67.0	66.0	58.0	46.0	36.0	36.0	36.0
	12	62.0	89.0	39.2	73.0	71.0	66.0	63.0	58.0	46.0	42.0	41.0	39.0
	13	56.7	78.5	36.4	69.0	67.0	62.0	59.0	48.0	43.0	39.0	39.0	36.0
	14	57.8	78.6	36.4	70.0	68.0	65.0	62.0	46.0	42.0	36.0	36.0	36.0
	15	54.8	78.4	36.4	69.0	65.0	58.0	51.0	41.0	39.0	36.0	36.0	36.0
	16	52.4	75.9	36.4	66.0	62.0	51.0	47.0	43.0	41.0	36.0	36.0	36.0
	17	52.8	74.5	36.4	67.0	64.0	55.0	50.0	43.0	39.0	36.0	36.0	36.0
	18	48.6	74.4	36.4	62.0	55.0	45.0	43.0	41.0	36.0	36.0	36.0	36.0
	19	52.1	74.8	36.4	62.0	57.0	56.0	55.0	50.0	44.0	36.0	36.0	36.0
	20	52.9	80.0	36.4	59.0	54.0	53.0	52.0	51.0	44.0	36.0	36.0	36.0
	21	52.9	74.0	39.4	64.0	57.0	55.0	54.0	51.0	49.0	45.0	44.0	42.0
Night	22	55.4	74.8	40.8	59.0	59.0	58.0	58.0	57.0	54.0	44.0	43.0	42.0
	23	52.1	58.6	36.4	55.0	55.0	55.0	54.0	53.0	52.0	47.0	45.0	39.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

				Energy Average Leq		24-Hour
Project Name:	Travertine	*JN:*	10780	*Day*	*Night*	*CNEL*
Location:	L3- Located near south of Avenue 58 on Madison Street northeast of the Project site near existing residential homes.	*Analyst:*	A. Wolfe	54.8	53.2	60.1
		Date:	8/16/2017			

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	47.1	67.4	37.5	56.0	54.0	52.0	50.0	45.0	42.0	37.0	37.0	37.0
	Max	58.0	84.2	43.5	69.0	66.0	64.0	62.0	58.0	53.0	46.0	45.0	44.0
Energy Average:		54.8	Average:		63.2	60.9	58.0	56.6	52.5	48.5	41.6	39.7	38.5
Night	Min	38.2	54.6	37.5	45.0	42.0	38.0	37.0	37.0	37.0	37.0	37.0	37.0
	Max	59.4	81.2	40.5	72.0	66.0	62.0	60.0	56.0	52.0	46.0	44.0	42.0
Energy Average:		53.2	Average:		57.3	54.2	50.1	48.2	43.8	41.3	38.6	38.2	37.8
Hourly Summary													
Night	0	41.1	58.3	37.5	51.0	48.0	44.0	42.0	40.0	37.0	37.0	37.0	37.0
	1	39.8	57.2	37.5	50.0	47.0	43.0	41.0	37.0	37.0	37.0	37.0	37.0
	2	38.2	54.6	37.5	45.0	42.0	38.0	37.0	37.0	37.0	37.0	37.0	37.0
	3	43.1	61.2	37.5	55.0	52.0	47.0	44.0	37.0	37.0	37.0	37.0	37.0
	4	55.4	79.7	37.5	66.0	62.0	57.0	55.0	48.0	43.0	37.0	37.0	37.0
	5	57.5	77.3	37.5	69.0	66.0	62.0	60.0	56.0	50.0	42.0	41.0	39.0
	6	59.4	81.2	40.5	72.0	66.0	61.0	59.0	55.0	52.0	46.0	44.0	42.0
Day	7	55.3	74.1	43.5	65.0	63.0	60.0	58.0	55.0	51.0	46.0	45.0	44.0
	8	54.7	71.1	40.5	63.0	62.0	59.0	58.0	55.0	51.0	45.0	44.0	42.0
	9	57.1	71.2	40.4	67.0	66.0	64.0	62.0	56.0	52.0	46.0	44.0	42.0
	10	56.9	84.2	37.5	62.0	59.0	57.0	56.0	52.0	49.0	44.0	43.0	40.0
	11	53.4	72.2	37.5	66.0	62.0	57.0	55.0	51.0	47.0	42.0	40.0	37.0
	12	56.6	75.6	39.4	64.0	62.0	60.0	60.0	58.0	53.0	44.0	42.0	40.0
	13	52.4	73.6	37.5	63.0	61.0	57.0	55.0	51.0	47.0	39.0	37.0	37.0
	14	55.6	74.0	37.5	67.0	65.0	61.0	59.0	53.0	49.0	42.0	40.0	37.0
	15	53.3	75.6	37.5	63.0	61.0	57.0	56.0	51.0	48.0	41.0	38.0	37.0
	16	53.3	74.7	37.5	63.0	60.0	57.0	56.0	52.0	49.0	39.0	37.0	37.0
	17	58.0	81.9	37.5	69.0	63.0	59.0	57.0	55.0	50.0	40.0	37.0	37.0
	18	52.0	79.6	37.5	60.0	57.0	55.0	54.0	49.0	44.0	37.0	37.0	37.0
	19	55.5	67.4	37.5	61.0	61.0	60.0	59.0	57.0	53.0	40.0	37.0	37.0
	20	50.0	73.3	37.5	59.0	57.0	55.0	54.0	48.0	43.0	40.0	38.0	37.0
	21	47.1	69.0	37.5	56.0	54.0	52.0	50.0	45.0	42.0	39.0	37.0	37.0
Night	22	44.0	59.2	37.5	54.0	52.0	49.0	48.0	42.0	40.0	37.0	37.0	37.0
	23	44.7	66.3	37.5	54.0	53.0	50.0	48.0	42.0	39.0	37.0	37.0	37.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name: Travertine

Location: L4- Located on Avenue 60 east of the Project site near existing residential homes.

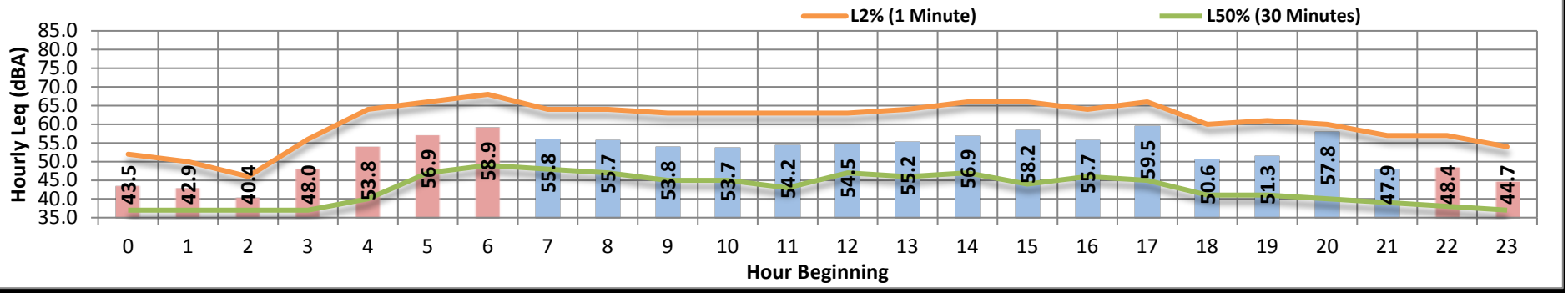
JN: 10780

Analyst: A. Wolfe

Date: 8/16/2017

Energy Average Leq		*24-Hour*
Day	*Night*	*CNEL*
55.6	52.8	60.1

Hourly Leq dBA Readings (unadjusted)



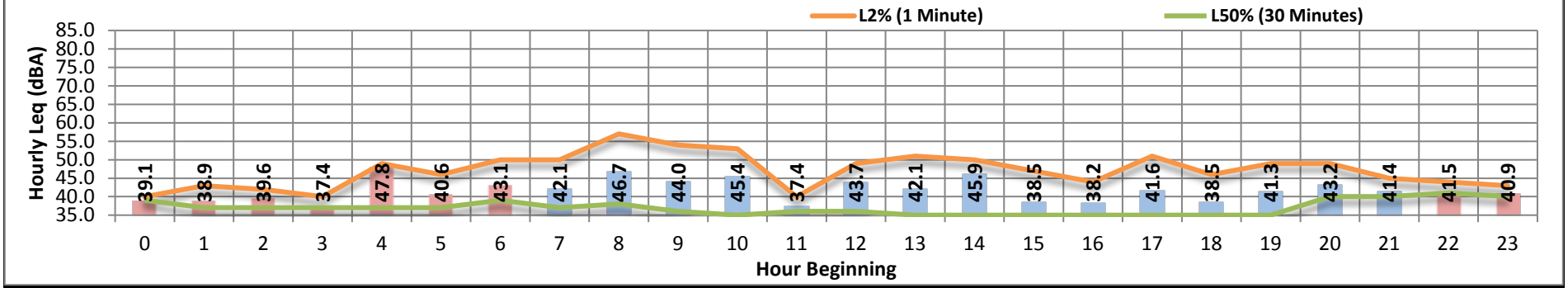
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	47.9	69.6	34.7	59.0	57.0	52.0	50.0	43.0	39.0	37.0	35.0	35.0
	Max	59.5	87.7	39.4	70.0	66.0	61.0	60.0	53.0	48.0	43.0	42.0	40.0
Energy Average:		55.6	Average:		65.3	62.9	58.9	57.0	50.1	44.3	38.7	38.1	36.9
Night	Min	40.4	62.6	34.7	51.0	46.0	40.0	38.0	37.0	37.0	35.0	35.0	35.0
	Max	58.9	79.6	39.6	70.0	68.0	63.0	61.0	55.0	49.0	42.0	41.0	40.0
Energy Average:		52.8	Average:		60.7	57.0	51.0	48.4	42.6	39.9	37.3	36.6	36.3
Hourly Summary													
Night	0	43.5	63.2	34.7	57.0	52.0	46.0	44.0	39.0	37.0	37.0	35.0	35.0
	1	42.9	66.1	34.7	55.0	50.0	42.0	39.0	37.0	37.0	35.0	35.0	35.0
	2	40.4	62.6	34.7	51.0	46.0	40.0	38.0	37.0	37.0	35.0	35.0	35.0
	3	48.0	71.3	34.7	61.0	56.0	48.0	45.0	37.0	37.0	37.0	35.0	35.0
	4	53.8	74.4	34.7	66.0	64.0	59.0	56.0	47.0	40.0	37.0	37.0	36.0
	5	56.9	78.0	37.5	69.0	66.0	62.0	60.0	52.0	47.0	39.0	37.0	37.0
	6	58.9	79.6	39.6	70.0	68.0	63.0	61.0	55.0	49.0	42.0	41.0	40.0
Day	7	55.8	74.8	39.4	67.0	64.0	61.0	59.0	53.0	48.0	43.0	42.0	40.0
	8	55.7	74.9	39.2	67.0	64.0	61.0	59.0	53.0	47.0	40.0	40.0	39.0
	9	53.8	72.1	37.6	65.0	63.0	59.0	58.0	51.0	45.0	40.0	40.0	39.0
	10	53.7	72.2	37.6	65.0	63.0	60.0	58.0	51.0	45.0	40.0	39.0	37.0
	11	54.2	78.8	37.6	65.0	63.0	59.0	57.0	48.0	43.0	39.0	38.0	37.0
	12	54.5	76.1	37.6	64.0	63.0	59.0	57.0	52.0	47.0	40.0	39.0	37.0
	13	55.2	74.7	37.6	67.0	64.0	60.0	58.0	51.0	46.0	39.0	38.0	37.0
	14	56.9	79.2	37.5	68.0	66.0	61.0	60.0	53.0	47.0	40.0	39.0	37.0
	15	58.2	85.8	34.7	69.0	66.0	60.0	58.0	51.0	44.0	37.0	37.0	35.0
	16	55.7	78.7	34.7	67.0	64.0	60.0	58.0	51.0	46.0	37.0	37.0	37.0
	17	59.5	87.7	34.7	70.0	66.0	61.0	59.0	53.0	45.0	37.0	35.0	35.0
	18	50.6	69.6	34.7	62.0	60.0	57.0	55.0	47.0	41.0	37.0	36.0	35.0
	19	51.3	71.4	34.7	63.0	61.0	57.0	55.0	48.0	41.0	37.0	37.0	35.0
	20	57.8	86.6	34.7	62.0	60.0	56.0	54.0	46.0	40.0	37.0	37.0	36.0
	21	47.9	69.7	37.6	59.0	57.0	52.0	50.0	43.0	39.0	37.0	37.0	37.0
Night	22	48.4	71.6	37.5	60.0	57.0	50.0	47.0	39.0	38.0	37.0	37.0	37.0
	23	44.7	64.8	37.5	57.0	54.0	49.0	46.0	40.0	37.0	37.0	37.0	37.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

			Energy Average Leq		24-Hour
Project Name:	Travertine	*JN:* 10780	*Day*	*Night*	*CNEL*
Location:	L5- Located east of the Project site on Monroe Street near existing residential homes south of Avenue 62.	*Analyst:* A. Wolfe	42.9	42.2	49.0
		Date: 8/16/2017			

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	37.4	57.4	33.0	46.0	40.0	37.0	36.0	35.0	35.0	35.0	35.0	35.0
	Max	46.7	74.0	37.7	59.0	57.0	52.0	49.0	43.0	40.0	39.0	38.0	37.0
Energy Average:		42.9	Average:		52.5	49.0	44.1	41.6	37.6	36.2	35.5	35.3	35.2
Night	Min	37.4	43.8	35.7	40.0	40.0	39.0	37.0	37.0	37.0	36.0	36.0	36.0
	Max	47.8	77.3	38.7	54.0	50.0	45.0	43.0	41.0	41.0	40.0	39.0	39.0
Energy Average:		42.2	Average:		46.7	44.1	41.9	40.8	39.0	38.2	37.0	36.8	36.7
Hourly Summary													
Night	0	39.1	54.5	35.9	41.0	40.0	40.0	40.0	39.0	39.0	37.0	36.0	36.0
	1	38.9	54.9	35.9	43.0	43.0	42.0	42.0	38.0	37.0	36.0	36.0	36.0
	2	39.6	59.4	36.0	48.0	42.0	40.0	39.0	38.0	37.0	37.0	37.0	36.0
	3	37.4	43.8	35.9	40.0	40.0	39.0	37.0	37.0	37.0	36.0	36.0	36.0
	4	47.8	77.3	35.9	54.0	49.0	44.0	41.0	38.0	37.0	36.0	36.0	36.0
	5	40.6	61.8	35.7	50.0	46.0	43.0	41.0	39.0	37.0	36.0	36.0	36.0
	6	43.1	64.4	35.9	54.0	50.0	45.0	43.0	40.0	39.0	36.0	36.0	36.0
Day	7	42.1	63.4	33.0	53.0	50.0	46.0	43.0	40.0	37.0	36.0	35.0	35.0
	8	46.7	66.1	33.0	59.0	57.0	52.0	49.0	42.0	38.0	35.0	35.0	35.0
	9	44.0	64.8	33.0	58.0	54.0	46.0	43.0	37.0	36.0	35.0	35.0	35.0
	10	45.4	70.7	33.0	57.0	53.0	48.0	44.0	36.0	35.0	35.0	35.0	35.0
	11	37.4	58.9	33.0	46.0	40.0	37.0	37.0	36.0	36.0	35.0	35.0	35.0
	12	43.7	68.6	33.0	55.0	49.0	42.0	40.0	37.0	36.0	35.0	35.0	35.0
	13	42.1	65.1	33.0	54.0	51.0	46.0	42.0	37.0	35.0	35.0	35.0	35.0
	14	45.9	74.0	33.0	54.0	50.0	44.0	40.0	36.0	35.0	35.0	35.0	35.0
	15	38.5	58.9	33.0	51.0	47.0	39.0	36.0	35.0	35.0	35.0	35.0	35.0
	16	38.2	59.4	33.0	47.0	44.0	41.0	39.0	36.0	35.0	35.0	35.0	35.0
	17	41.6	62.4	33.0	54.0	51.0	44.0	41.0	36.0	35.0	35.0	35.0	35.0
	18	38.5	57.4	33.0	50.0	46.0	41.0	39.0	36.0	35.0	35.0	35.0	35.0
	19	41.3	68.6	33.0	52.0	49.0	45.0	42.0	36.0	35.0	35.0	35.0	35.0
	20	43.2	61.3	35.8	50.0	49.0	47.0	46.0	43.0	40.0	37.0	37.0	36.0
	21	41.4	59.3	37.7	47.0	45.0	44.0	43.0	41.0	40.0	39.0	38.0	37.0
Night	22	41.5	57.9	37.7	46.0	44.0	42.0	42.0	41.0	41.0	40.0	39.0	39.0
	23	40.9	49.3	38.7	44.0	43.0	42.0	42.0	41.0	40.0	39.0	39.0	39.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name: Travertine

Location: L6- Located east of the Project site on Monroe Street near an existing park, north of Avenue 64.

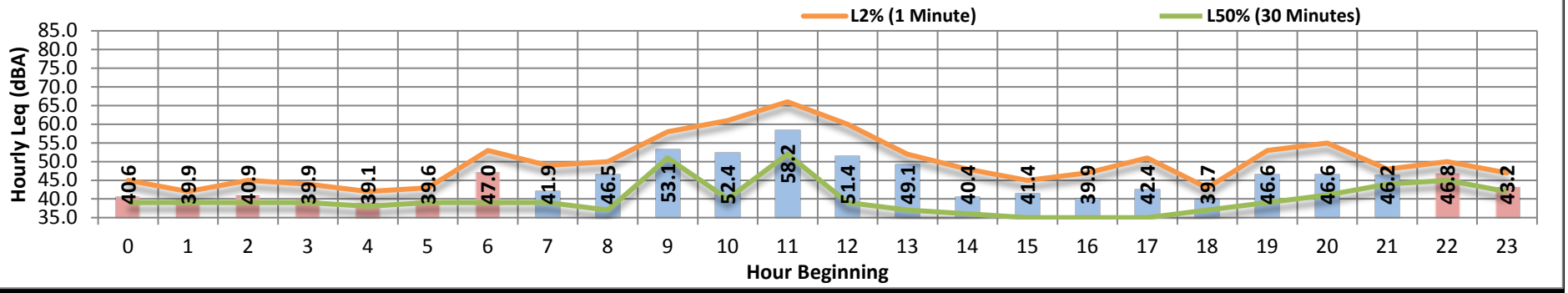
JN: 10780

Analyst: A. Wolfe

Date: 8/16/2017

Energy Average Leq		24-Hour
Day	*Night*	*CNEL*
50.0	43.0	51.8

Hourly Leq dBA Readings (unadjusted)



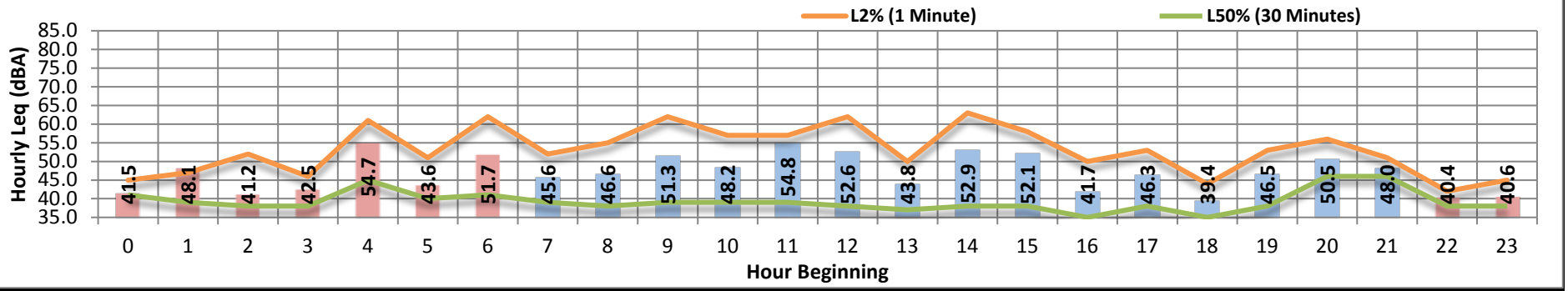
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	39.7	53.3	34.8	44.0	43.0	41.0	39.0	37.0	35.0	35.0	35.0	35.0
	Max	58.2	75.0	39.5	67.0	66.0	65.0	63.0	58.0	52.0	45.0	43.0	40.0
Energy Average:		50.0	Average:		54.9	52.4	49.5	47.9	43.5	39.8	36.7	36.5	36.1
Night	Min	39.1	49.5	35.0	43.0	42.0	40.0	40.0	39.0	38.0	37.0	37.0	37.0
	Max	47.0	72.9	40.7	57.0	53.0	50.0	49.0	46.0	45.0	41.0	41.0	40.0
Energy Average:		43.0	Average:		47.7	45.7	43.6	42.7	41.1	39.9	38.2	38.0	37.9
Hourly Summary													
Night	0	40.6	53.4	37.7	49.0	45.0	41.0	40.0	40.0	39.0	39.0	39.0	39.0
	1	39.9	49.7	37.7	43.0	42.0	41.0	41.0	40.0	39.0	38.0	37.0	37.0
	2	40.9	52.1	37.7	47.0	45.0	43.0	42.0	41.0	39.0	38.0	37.0	37.0
	3	39.9	49.5	37.6	45.0	44.0	43.0	42.0	40.0	39.0	37.0	37.0	37.0
	4	39.1	51.7	37.7	44.0	42.0	40.0	40.0	39.0	38.0	37.0	37.0	37.0
	5	39.6	50.4	37.3	44.0	43.0	41.0	41.0	40.0	39.0	37.0	37.0	37.0
	6	47.0	72.9	35.0	57.0	53.0	48.0	46.0	42.0	39.0	37.0	37.0	37.0
Day	7	41.9	53.3	34.8	50.0	49.0	46.0	45.0	41.0	39.0	37.0	37.0	37.0
	8	46.5	75.0	34.8	55.0	50.0	47.0	44.0	40.0	37.0	35.0	35.0	35.0
	9	53.1	69.5	39.1	58.0	58.0	57.0	57.0	54.0	51.0	45.0	43.0	40.0
	10	52.4	65.0	34.8	62.0	61.0	59.0	57.0	53.0	40.0	35.0	35.0	35.0
	11	58.2	70.7	34.8	67.0	66.0	65.0	63.0	58.0	52.0	37.0	36.0	35.0
	12	51.4	63.7	34.8	60.0	60.0	58.0	57.0	52.0	39.0	35.0	35.0	35.0
	13	49.1	73.9	34.8	60.0	52.0	47.0	44.0	39.0	37.0	35.0	35.0	35.0
	14	40.4	59.5	34.8	51.0	48.0	44.0	42.0	38.0	36.0	35.0	35.0	35.0
	15	41.4	63.9	34.8	51.0	45.0	41.0	39.0	37.0	35.0	35.0	35.0	35.0
	16	39.9	62.6	34.8	49.0	47.0	44.0	42.0	37.0	35.0	35.0	35.0	35.0
	17	42.4	63.2	34.8	55.0	51.0	46.0	43.0	37.0	35.0	35.0	35.0	35.0
	18	39.7	65.8	34.8	44.0	43.0	41.0	40.0	38.0	37.0	35.0	35.0	35.0
	19	46.6	69.8	34.8	56.0	53.0	51.0	50.0	42.0	39.0	37.0	37.0	37.0
	20	46.6	67.5	37.7	57.0	55.0	51.0	49.0	42.0	41.0	39.0	39.0	38.0
	21	46.2	73.0	39.5	49.0	48.0	46.0	46.0	45.0	44.0	40.0	40.0	40.0
Night	22	46.8	68.1	40.7	50.0	50.0	50.0	49.0	46.0	45.0	41.0	41.0	40.0
	23	43.2	60.4	40.1	50.0	47.0	45.0	43.0	42.0	42.0	40.0	40.0	40.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

			Energy Average Leq		24-Hour
Project Name:	Travertine	*JN:* 10780	*Day*	*Night*	*CNEL*
Location:	L7- Located near on Avenue 62 east of the Project site near existing residential homes.	*Analyst:* A. Wolfe	49.8	48.2	55.2
		Date: 8/16/2017			

Hourly Leq dBA Readings (unadjusted)



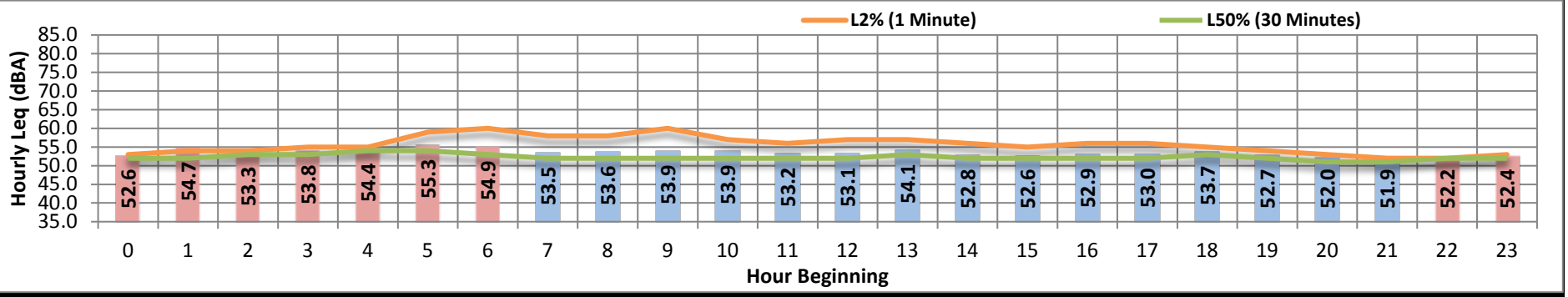
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	39.4	58.2	35.5	47.0	44.0	41.0	40.0	38.0	35.0	35.0	35.0	35.0
	Max	54.8	81.7	40.0	66.0	63.0	57.0	54.0	47.0	46.0	43.0	42.0	41.0
Energy Average:		49.8	Average:		58.5	54.9	49.9	46.9	41.9	38.9	35.9	35.7	35.4
Night	Min	40.4	48.8	35.5	45.0	42.0	38.0	38.0	38.0	38.0	35.0	35.0	35.0
	Max	54.7	80.3	38.4	66.0	62.0	56.0	54.0	49.0	45.0	38.0	38.0	38.0
Energy Average:		48.2	Average:		53.6	50.1	45.6	44.1	41.6	39.8	37.7	37.7	37.3
Hourly Summary													
Night	0	41.5	48.8	35.5	45.0	45.0	44.0	44.0	42.0	41.0	38.0	38.0	35.0
	1	48.1	77.0	38.4	52.0	47.0	46.0	43.0	40.0	39.0	38.0	38.0	38.0
	2	41.2	55.7	35.5	53.0	52.0	38.0	38.0	38.0	38.0	35.0	35.0	35.0
	3	42.5	67.7	35.5	50.0	46.0	42.0	40.0	40.0	38.0	38.0	38.0	38.0
	4	54.7	80.3	38.0	65.0	61.0	56.0	54.0	49.0	45.0	38.0	38.0	38.0
	5	43.6	66.0	38.3	54.0	51.0	46.0	44.0	41.0	40.0	38.0	38.0	38.0
	6	51.7	74.2	38.1	66.0	62.0	55.0	51.0	44.0	41.0	38.0	38.0	38.0
Day	7	45.6	68.7	35.5	55.0	52.0	49.0	47.0	42.0	39.0	37.0	36.0	35.0
	8	46.6	69.7	35.5	59.0	55.0	50.0	47.0	40.0	38.0	35.0	35.0	35.0
	9	51.3	71.9	35.5	64.0	62.0	57.0	54.0	45.0	39.0	35.0	35.0	35.0
	10	48.2	68.8	35.5	60.0	57.0	53.0	50.0	46.0	39.0	35.0	35.0	35.0
	11	54.8	81.7	35.5	63.0	57.0	52.0	49.0	42.0	39.0	35.0	35.0	35.0
	12	52.6	77.4	35.5	66.0	62.0	56.0	52.0	42.0	38.0	35.0	35.0	35.0
	13	43.8	69.6	35.5	53.0	50.0	45.0	42.0	38.0	37.0	35.0	35.0	35.0
	14	52.9	77.5	35.5	66.0	63.0	53.0	48.0	42.0	38.0	35.0	35.0	35.0
	15	52.1	78.1	35.5	64.0	58.0	50.0	44.0	41.0	38.0	35.0	35.0	35.0
	16	41.7	58.2	35.5	52.0	50.0	47.0	44.0	41.0	35.0	35.0	35.0	35.0
	17	46.3	70.9	35.5	56.0	53.0	48.0	45.0	40.0	38.0	35.0	35.0	35.0
	18	39.4	63.9	35.5	47.0	44.0	41.0	40.0	38.0	35.0	35.0	35.0	35.0
	19	46.5	74.2	35.5	55.0	53.0	49.0	45.0	39.0	38.0	35.0	35.0	35.0
	20	50.5	75.8	35.5	61.0	56.0	51.0	49.0	47.0	46.0	38.0	38.0	35.0
	21	48.0	68.7	40.0	57.0	51.0	47.0	47.0	46.0	46.0	43.0	42.0	41.0
Night	22	40.4	64.9	38.3	47.0	42.0	41.0	41.0	40.0	38.0	38.0	38.0	38.0
	23	40.6	55.0	37.7	50.0	45.0	42.0	42.0	40.0	38.0	38.0	38.0	38.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

			Energy Average Leq		24-Hour
Project Name:	Travertine	*JN:* 10780	*Day*	*Night*	*CNEL*
Location:	L8- Located on Avenue 60, west of Madison Street, near existing residential homes and future residential use.	*Analyst:* A. Wolfe	53.2	53.9	60.4
		Date: 8/16/2017			

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	51.9	56.0	50.0	53.0	52.0	52.0	52.0	52.0	51.0	51.0	51.0	50.0
	Max	54.1	77.6	51.2	62.0	60.0	55.0	55.0	54.0	53.0	52.0	52.0	51.0
Energy Average:		53.2	Average:		58.1	56.0	53.9	53.5	52.5	52.0	51.4	51.2	50.8
Night	Min	52.2	53.8	50.8	52.0	52.0	52.0	52.0	52.0	52.0	51.0	51.0	51.0
	Max	55.3	82.0	52.7	62.0	60.0	57.0	55.0	54.0	54.0	53.0	53.0	53.0
Energy Average:		53.9	Average:		55.9	55.0	54.0	53.7	53.1	52.8	52.0	51.9	51.7
Hourly Summary													
Night	0	52.6	67.5	51.6	54.0	53.0	53.0	53.0	52.0	52.0	52.0	52.0	51.0
	1	54.7	82.0	51.3	57.0	54.0	54.0	54.0	53.0	52.0	51.0	51.0	51.0
	2	53.3	57.7	51.8	54.0	54.0	54.0	54.0	53.0	53.0	52.0	52.0	52.0
	3	53.8	64.1	52.0	56.0	55.0	54.0	54.0	54.0	53.0	52.0	52.0	52.0
	4	54.4	69.8	52.4	56.0	55.0	54.0	54.0	54.0	54.0	53.0	53.0	52.0
	5	55.3	74.2	52.7	59.0	59.0	56.0	55.0	54.0	54.0	53.0	53.0	53.0
	6	54.9	69.2	52.0	62.0	60.0	57.0	55.0	54.0	53.0	52.0	52.0	52.0
Day	7	53.5	69.7	51.1	60.0	58.0	55.0	54.0	53.0	52.0	52.0	52.0	51.0
	8	53.6	69.3	50.5	60.0	58.0	55.0	55.0	53.0	52.0	51.0	51.0	51.0
	9	53.9	67.0	51.2	62.0	60.0	55.0	54.0	53.0	52.0	52.0	52.0	51.0
	10	53.9	72.1	51.2	59.0	57.0	55.0	54.0	53.0	52.0	52.0	52.0	51.0
	11	53.2	69.0	50.8	59.0	56.0	53.0	53.0	52.0	52.0	52.0	51.0	51.0
	12	53.1	67.0	50.7	59.0	57.0	54.0	53.0	52.0	52.0	51.0	51.0	51.0
	13	54.1	73.3	51.0	60.0	57.0	55.0	55.0	54.0	53.0	52.0	51.0	51.0
	14	52.8	66.5	50.6	58.0	56.0	54.0	53.0	52.0	52.0	51.0	51.0	51.0
	15	52.6	69.3	50.6	58.0	55.0	53.0	53.0	52.0	52.0	51.0	51.0	51.0
	16	52.9	71.3	50.2	60.0	56.0	53.0	53.0	52.0	52.0	51.0	51.0	50.0
	17	53.0	68.4	50.8	58.0	56.0	54.0	53.0	52.0	52.0	51.0	51.0	51.0
	18	53.7	77.6	51.1	55.0	55.0	54.0	54.0	53.0	53.0	52.0	51.0	51.0
	19	52.7	57.1	50.6	55.0	54.0	54.0	54.0	53.0	52.0	51.0	51.0	51.0
	20	52.0	59.9	50.2	55.0	53.0	52.0	52.0	52.0	51.0	51.0	51.0	50.0
	21	51.9	56.0	50.0	53.0	52.0	52.0	52.0	52.0	51.0	51.0	51.0	50.0
Night	22	52.2	53.8	50.8	52.0	52.0	52.0	52.0	52.0	52.0	51.0	51.0	51.0
	23	52.4	58.4	51.1	53.0	53.0	52.0	52.0	52.0	52.0	52.0	51.0	51.0

URBAN CROSSROADS

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Av. 58
Road Segment: w/o Madison St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,600 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	149 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-10.68	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-27.92	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-31.88	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.3	58.6	57.3	51.2	59.7	60.3
Medium Trucks:	53.9	50.3	42.8	51.5	57.7	57.7
Heavy Trucks:	54.3	50.6	47.2	51.8	58.0	58.1
Vehicle Noise:	62.0	59.7	57.8	56.3	63.3	63.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	34	73	158
CNEL:	17	36	77	165

Monday, December 28, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Av. 58
Road Segment: w/o Jackson St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,800 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	167 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-10.17	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-27.41	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-31.37	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.1	57.4	56.1	50.1	58.5	59.2
Medium Trucks:	52.7	49.1	41.6	50.4	56.6	56.6
Heavy Trucks:	53.1	49.4	46.0	50.7	56.9	57.0
Vehicle Noise:	60.8	58.6	56.7	55.2	62.2	62.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	32	70	151
CNEL:	16	34	73	158

Monday, December 28, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Av. 58
Road Segment: w/o Monroe St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,300 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	214 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-9.11	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-26.34	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-30.30	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.8	60.1	58.8	52.8	61.2	61.9
Medium Trucks:	55.4	51.9	44.4	53.1	59.3	59.3
Heavy Trucks:	55.9	52.1	48.7	53.4	59.6	59.7
Vehicle Noise:	63.5	61.3	59.4	57.9	64.9	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	93	201
CNEL:	21	45	98	211

Monday, December 28, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Madison St.
Road Segment: s/o Av. 56
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,700 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	623 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.88	1.42	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-22.12	1.45	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-26.07	1.45	-1.20	-5.51	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.4	64.1	58.1	66.5	67.1
Medium Trucks:	60.5	57.0	49.5	58.2	64.4	64.4
Heavy Trucks:	60.6	56.8	53.5	58.1	64.3	64.4
Vehicle Noise:	68.7	66.5	64.6	62.9	70.0	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	92	199	428
CNEL:	45	97	209	450

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Av. 60
Road Segment: w/o Jackson St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,200 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	112 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-12.35	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-29.58	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-33.54	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.2	55.6	54.2	48.2	56.6	57.3
Medium Trucks:	50.6	47.1	39.6	48.3	54.5	54.5
Heavy Trucks:	50.7	47.0	43.6	48.2	54.4	54.5
Vehicle Noise:	58.8	56.6	54.7	53.0	60.1	60.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	30	65	140
CNEL:	15	32	68	147

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Av. 62
Road Segment: w/o Jackson St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,700 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	158 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-10.42	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-27.66	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-31.61	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.9	57.2	55.9	49.9	58.3	58.9
Medium Trucks:	52.5	48.9	41.4	50.1	56.3	56.4
Heavy Trucks:	52.9	49.2	45.8	50.4	56.6	56.7
Vehicle Noise:	60.6	58.4	56.4	54.9	61.9	62.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	31	67	145
CNEL:	15	33	71	152

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Av. 62
Road Segment: w/o Monroe St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	600 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	56 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	40.084
Medium Trucks:	39.863
Heavy Trucks:	39.885

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-14.94	1.34	-1.20	-4.60	0.000	0.000
Medium Trucks:	81.00	-32.18	1.37	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-36.14	1.37	-1.20	-5.53	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:	55.4	53.7	52.4	46.4	54.8	55.4
Medium Trucks:	49.0	45.4	37.9	46.7	52.8	52.9
Heavy Trucks:	49.4	45.7	42.3	46.9	53.1	53.2
Vehicle Noise:	57.1	54.9	52.9	51.4	58.4	58.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	15	33	71
CNEL:	7	16	35	75

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Monroe St.
Road Segment: s/o Av. 60

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,600 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	149 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-10.68	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-27.92	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-31.88	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.3	58.6	57.3	51.2	59.7	60.3
Medium Trucks:	53.9	50.3	42.8	51.5	57.7	57.7
Heavy Trucks:	54.3	50.6	47.2	51.8	58.0	58.1
Vehicle Noise:	62.0	59.7	57.8	56.3	63.3	63.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	34	73	158
CNEL:	17	36	77	165

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Monroe St.
Road Segment: s/o Av. 58

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,700 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	251 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-8.82	1.42	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-26.06	1.45	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-30.02	1.45	-1.20	*-5.51*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.2	61.5	60.2	54.2	62.6	63.2
Medium Trucks:	56.6	53.0	45.5	54.3	60.4	60.5
Heavy Trucks:	56.6	52.9	49.5	54.1	60.3	60.4
Vehicle Noise:	64.8	62.6	60.7	59.0	66.0	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	50	108	233
CNEL:	25	53	114	245

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Jackson St.
Road Segment: s/o Airport Bl.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,400 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	223 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-9.34	-0.99	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	82.40	-26.57	-0.97	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-30.53	-0.97	-1.20	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.3	58.6	57.3	51.2	59.7	60.3
Medium Trucks:	53.7	50.1	42.6	51.3	57.5	57.5
Heavy Trucks:	53.7	50.0	46.6	51.2	57.4	57.5
Vehicle Noise:	61.8	59.6	57.7	56.0	63.1	63.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	22	48	103	222
CNEL:	23	50	108	233

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Monroe St.
Road Segment: s/o Av. 56

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,400 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	316 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-7.82	1.42	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-25.06	1.45	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-29.02	1.45	-1.20	*-5.51*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.2	62.5	61.2	55.2	63.6	64.2
Medium Trucks:	57.6	54.0	46.5	55.3	61.4	61.5
Heavy Trucks:	57.6	53.9	50.5	55.2	61.3	61.4
Vehicle Noise:	65.8	63.6	61.7	60.0	67.0	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	59	126	272
CNEL:	29	62	133	286

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + P
Road Name: Av. 58
Road Segment: w/o Madison St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,300 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	679 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-4.09	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	81.00	-21.33	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-25.28	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.9	65.2	63.8	57.8	66.3	66.9
Medium Trucks:	60.5	56.9	49.4	58.1	64.3	64.3
Heavy Trucks:	60.9	57.1	53.7	58.4	64.6	64.7
Vehicle Noise:	68.6	66.3	64.4	62.9	69.9	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	43	93	201	434
CNEL:	46	98	211	455

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + P
Road Name: Av. 58
Road Segment: w/o Monroe St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	372 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-6.70	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-23.94	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-27.90	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	62.5	61.2	55.2	63.6	64.3
Medium Trucks:	57.8	54.3	46.8	55.5	61.7	61.7
Heavy Trucks:	58.3	54.5	51.1	55.8	62.0	62.1
Vehicle Noise:	65.9	63.7	61.8	60.3	67.3	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	63	135	290
CNEL:	30	66	141	305

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + P
Road Name: Madison St.
Road Segment: s/o Av. 56

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,100 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	939 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.09	1.42	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-20.33	1.45	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-24.29	1.45	-1.20	-5.51	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.2	65.9	59.9	68.3	68.9
Medium Trucks:	62.3	58.7	51.2	60.0	66.2	66.2
Heavy Trucks:	62.4	58.6	55.2	59.9	66.1	66.2
Vehicle Noise:	70.5	68.3	66.4	64.7	71.7	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	261	562
CNEL:	59	127	275	591

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + P
Road Name: Av. 58
Road Segment: w/o Jackson St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	279 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-7.95	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-25.19	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-29.15	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.4	59.7	58.4	52.3	60.8	61.4
Medium Trucks:	54.9	51.4	43.9	52.6	58.8	58.8
Heavy Trucks:	55.4	51.6	48.2	52.9	59.1	59.2
Vehicle Noise:	63.1	60.8	58.9	57.4	64.4	64.7

Centerline Distance to Noise Contour (in feet)

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

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + P
Road Name: Av. 60
Road Segment: w/o Jackson St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,800 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	167 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-10.58	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-27.82	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-31.78	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.0	57.3	56.0	50.0	58.4	59.0
Medium Trucks:	52.4	48.8	41.3	50.1	56.2	56.3
Heavy Trucks:	52.4	48.7	45.3	50.0	56.2	56.3
Vehicle Noise:	60.6	58.4	56.5	54.8	61.8	62.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	85	183
CNEL:	19	41	89	192

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + P
Road Name: Av. 62
Road Segment: w/o Monroe St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,300 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	586 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	40.084
Medium Trucks:	39.863
Heavy Trucks:	39.885

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-4.73	1.34	-1.20	-4.60	0.000	0.000
Medium Trucks:	81.00	-21.97	1.37	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-25.92	1.37	-1.20	-5.53	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:	65.6	63.9	62.6	56.6	65.0	65.6
Medium Trucks:	59.2	55.6	48.1	56.9	63.0	63.1
Heavy Trucks:	59.6	55.9	52.5	57.1	63.3	63.4
Vehicle Noise:	67.3	65.1	63.1	61.6	68.7	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	74	159	342
CNEL:	36	77	167	359

Monday, December 28, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + P
Road Name: Monroe St.
Road Segment: s/o Av. 60
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	465 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-5.73	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-22.97	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-26.93	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.2	63.5	62.2	56.2	64.6	65.2
Medium Trucks:	58.8	55.2	47.7	56.5	62.6	62.7
Heavy Trucks:	59.2	55.5	52.1	56.7	62.9	63.0
Vehicle Noise:	66.9	64.7	62.7	61.2	68.3	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	73	156	337
CNEL:	35	76	164	354

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + P
Road Name: Av. 62
Road Segment: w/o Jackson St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	372 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-6.70	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-23.94	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-27.90	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.6	60.9	59.6	53.6	62.0	62.6
Medium Trucks:	56.2	52.6	45.1	53.9	60.0	60.1
Heavy Trucks:	56.6	52.9	49.5	54.1	60.3	60.4
Vehicle Noise:	64.3	62.1	60.1	58.6	65.7	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	55	119	257
CNEL:	27	58	125	270

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + P
Road Name: Monroe St.
Road Segment: s/o Av. 58
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,500 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	512 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.73	1.42	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-22.97	1.45	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-26.93	1.45	-1.20	-5.51	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.6	63.3	57.2	65.7	66.3
Medium Trucks:	59.7	56.1	48.6	57.4	63.5	63.6
Heavy Trucks:	59.7	56.0	52.6	57.2	63.4	63.5
Vehicle Noise:	67.9	65.6	63.7	62.1	69.1	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	81	174	375
CNEL:	39	85	183	394

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + P
Road Name: Monroe St.
Road Segment: s/o Av. 56

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,800 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	632 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-4.81	1.42	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-22.05	1.45	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-26.01	1.45	-1.20	*-5.51*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.2	65.5	64.2	58.2	66.6	67.2
Medium Trucks:	60.6	57.0	49.5	58.3	64.4	64.5
Heavy Trucks:	60.6	56.9	53.5	58.2	64.4	64.5
Vehicle Noise:	68.8	66.6	64.7	63.0	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	43	93	200	432
CNEL:	45	98	211	454

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3
Road Name: Av. 58
Road Segment: w/o Madison St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	558 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-4.94	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	81.00	-22.18	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-26.14	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.0	64.3	63.0	57.0	65.4	66.0
Medium Trucks:	59.6	56.0	48.5	57.3	63.4	63.5
Heavy Trucks:	60.0	56.3	52.9	57.5	63.7	63.8
Vehicle Noise:	67.7	65.5	63.5	62.0	69.1	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	82	177	380
CNEL:	40	86	185	399

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + P
Road Name: Jackson St.
Road Segment: s/o Airport Bl.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,500 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	326 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-7.70	-0.99	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	82.40	-24.94	-0.97	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-28.89	-0.97	-1.20	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.9	60.2	58.9	52.9	61.3	61.9
Medium Trucks:	55.3	51.7	44.2	53.0	59.1	59.2
Heavy Trucks:	55.3	51.6	48.2	52.9	59.1	59.1
Vehicle Noise:	63.5	61.3	59.4	57.7	64.7	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	61	132	285
CNEL:	30	65	139	300

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3
Road Name: Av. 58
Road Segment: w/o Monroe St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,100 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	753 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-3.64	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	81.00	-20.88	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-24.83	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.3	65.6	64.3	58.3	66.7	67.3
Medium Trucks:	60.9	57.3	49.8	58.6	64.7	64.8
Heavy Trucks:	61.3	57.6	54.2	58.8	65.0	65.1
Vehicle Noise:	69.0	66.8	64.8	63.3	70.4	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	46	100	216	465
CNEL:	49	105	226	488

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 | Project Name: Travertine
Road Name: Av. 58 | Job Number: 12189
Road Segment: w/o Jackson St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,700 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	716 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.86	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-21.10	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-25.05	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.5	63.8	62.4	56.4	64.9	65.5
Medium Trucks:	59.0	55.5	48.0	56.7	62.9	62.9
Heavy Trucks:	59.5	55.7	52.3	57.0	63.2	63.3
Vehicle Noise:	67.2	64.9	63.0	61.5	68.5	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	40	86	184	397
CNEL:	42	90	194	417

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 | Project Name: Travertine
Road Name: Av. 60 | Job Number: 12189
Road Segment: w/o Jackson St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,100 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	567 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.28	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-22.52	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-26.48	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.3	62.6	61.3	55.3	63.7	64.3
Medium Trucks:	57.7	54.1	46.6	55.4	61.5	61.6
Heavy Trucks:	57.7	54.0	50.6	55.3	61.5	61.6
Vehicle Noise:	65.9	63.7	61.8	60.1	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	89	192	413
CNEL:	43	94	202	434

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 | Project Name: Travertine
Road Name: Madison St. | Job Number: 12189
Road Segment: s/o Av. 56

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,500 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,907 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.02	1.42	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-17.26	1.45	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-21.21	1.45	-1.20	-5.51	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.0	70.3	69.0	63.0	71.4	72.0
Medium Trucks:	65.4	61.8	54.3	63.1	69.2	69.3
Heavy Trucks:	65.4	61.7	58.3	63.0	69.2	69.2
Vehicle Noise:	73.6	71.4	69.5	67.8	74.8	75.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	90	194	418	901
CNEL:	95	204	440	948

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 | Project Name: Travertine
Road Name: Av. 62 | Job Number: 12189
Road Segment: w/o Monroe St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,800 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	167 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	40.084
Medium Trucks:	39.863
Heavy Trucks:	39.885

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-10.17	1.34	-1.20	-4.60	0.000	0.000
Medium Trucks:	81.00	-27.41	1.37	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-31.37	1.37	-1.20	-5.53	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:	60.2	58.5	57.2	51.2	59.6	60.2
Medium Trucks:	53.8	50.2	42.7	51.4	57.6	57.6
Heavy Trucks:	54.2	50.5	47.1	51.7	57.9	58.0
Vehicle Noise:	61.9	59.6	57.7	56.2	63.2	63.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	32	69	148
CNEL:	16	34	72	156

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 | Project Name: Travertine
Road Name: Av. 62 | Job Number: 12189
Road Segment: w/o Jackson St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,700 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	623 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-4.46	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-21.70	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-25.66	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.9	63.2	61.8	55.8	64.3	64.9
Medium Trucks:	58.4	54.9	47.4	56.1	62.3	62.3
Heavy Trucks:	58.9	55.1	51.7	56.4	62.6	62.7
Vehicle Noise:	66.6	64.3	62.4	60.9	67.9	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	78	168	362
CNEL:	38	82	176	380

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 | Project Name: Travertine
Road Name: Monroe St. | Job Number: 12189
Road Segment: s/o Av. 58

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,100 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,125 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.31	1.42	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-19.55	1.45	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-23.50	1.45	-1.20	*-5.51*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	68.0	66.7	60.7	69.1	69.7
Medium Trucks:	63.1	59.5	52.0	60.8	66.9	67.0
Heavy Trucks:	63.1	59.4	56.0	60.7	66.9	67.0
Vehicle Noise:	71.3	69.1	67.2	65.5	72.5	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	63	137	294	634
CNEL:	67	144	310	667

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 | Project Name: Travertine
Road Name: Monroe St. | Job Number: 12189
Road Segment: s/o Av. 60

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,200 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	763 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.59	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	81.00	-20.82	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-24.78	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.4	65.7	64.3	58.3	66.8	67.4
Medium Trucks:	61.0	57.4	49.9	58.6	64.8	64.8
Heavy Trucks:	61.4	57.6	54.3	58.9	65.1	65.2
Vehicle Noise:	69.1	66.8	64.9	63.4	70.4	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	101	217	469
CNEL:	49	106	228	492

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 | Project Name: Travertine
Road Name: Monroe St. | Job Number: 12189
Road Segment: s/o Av. 56

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,500 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,163 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.17	1.42	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-19.41	1.45	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-23.36	1.45	-1.20	*-5.51*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.8	68.1	66.8	60.8	69.2	69.9
Medium Trucks:	63.3	59.7	52.2	60.9	67.1	67.1
Heavy Trucks:	63.3	59.6	56.2	60.8	67.0	67.1
Vehicle Noise:	71.4	69.2	67.3	65.6	72.7	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	65	140	301	648
CNEL:	68	147	316	682

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 | Project Name: Travertine
Road Name: Jackson St. | Job Number: 12189
Road Segment: s/o Airport Bl.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,400 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	967 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.97	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-20.21	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-24.16	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	64.9	63.6	57.6	66.0	66.7
Medium Trucks:	60.0	56.4	48.9	57.7	63.9	63.9
Heavy Trucks:	60.1	56.3	52.9	57.6	63.8	63.9
Vehicle Noise:	68.2	66.0	64.1	62.4	69.5	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	127	273	589
CNEL:	62	133	288	620

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 + P | Project Name: Travertine
Road Name: Av. 58 | Job Number: 12189
Road Segment: w/o Monroe St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,800 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	911 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.81	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-20.05	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-24.01	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.1	66.4	65.1	59.1	67.5	68.2
Medium Trucks:	61.7	58.1	50.6	59.4	65.6	65.6
Heavy Trucks:	62.1	58.4	55.0	59.7	65.9	66.0
Vehicle Noise:	69.8	67.6	65.7	64.2	71.2	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	245	528
CNEL:	55	119	257	554

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 + P | Project Name: Travertine
Road Name: Av. 58 | Job Number: 12189
Road Segment: w/o Madison St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,600 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,079 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.08	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-19.32	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-23.27	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.2	65.9	59.8	68.3	68.9
Medium Trucks:	62.5	58.9	51.4	60.1	66.3	66.3
Heavy Trucks:	62.9	59.2	55.8	60.4	66.6	66.7
Vehicle Noise:	70.6	68.3	66.4	64.9	71.9	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	127	274	590
CNEL:	62	134	288	620

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 + P | Project Name: Travertine
Road Name: Av. 58 | Job Number: 12189
Road Segment: w/o Jackson St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,900 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	828 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.23	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-20.47	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-24.42	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.4	63.1	57.1	65.5	66.1
Medium Trucks:	59.7	56.1	48.6	57.3	63.5	63.5
Heavy Trucks:	60.1	56.4	53.0	57.6	63.8	63.9
Vehicle Noise:	67.8	65.5	63.6	62.1	69.1	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	94	203	437
CNEL:	46	99	213	459

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 + P
Road Name: Madison St.
Road Segment: s/o Av. 56

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,900 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,223 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.65	1.42	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-16.59	1.45	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-20.55	1.45	-1.20	-5.51	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.6	70.9	69.6	63.6	72.0	72.7
Medium Trucks:	66.1	62.5	55.0	63.7	69.9	69.9
Heavy Trucks:	66.1	62.4	59.0	63.6	69.8	69.9
Vehicle Noise:	74.2	72.0	70.1	68.4	75.5	75.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	100	215	463	998
CNEL:	105	226	487	1,050

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 + P
Road Name: Av. 62
Road Segment: w/o Monroe St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,500 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	698 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	40.084
Medium Trucks:	39.863
Heavy Trucks:	39.885

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.97	1.34	-1.20	-4.60	0.000	0.000
Medium Trucks:	81.00	-21.21	1.37	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-25.17	1.37	-1.20	-5.53	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:	66.4	64.7	63.4	57.3	65.8	66.4
Medium Trucks:	60.0	56.4	48.9	57.6	63.8	63.8
Heavy Trucks:	60.4	56.7	53.3	57.9	64.1	64.2
Vehicle Noise:	68.1	65.8	63.9	62.4	69.4	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	38	83	178	384
CNEL:	40	87	187	403

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 + P
Road Name: Av. 60
Road Segment: w/o Jackson St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,700 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	623 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.88	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-22.12	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-26.07	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.7	63.0	61.7	55.7	64.1	64.7
Medium Trucks:	58.1	54.5	47.0	55.8	62.0	62.0
Heavy Trucks:	58.2	54.4	51.0	55.7	61.9	62.0
Vehicle Noise:	66.3	64.1	62.2	60.5	67.6	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	204	439
CNEL:	46	100	215	462

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 + P
Road Name: Av. 62
Road Segment: w/o Jackson St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	837 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.18	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-20.42	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-24.38	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.4	63.1	57.1	65.5	66.2
Medium Trucks:	59.7	56.1	48.6	57.4	63.6	63.6
Heavy Trucks:	60.1	56.4	53.0	57.7	63.9	64.0
Vehicle Noise:	67.8	65.6	63.7	62.2	69.2	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	205	441
CNEL:	46	100	215	463

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 + P
Road Name: Monroe St.
Road Segment: s/o Av. 60

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,600 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,079 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.08	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-19.32	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-23.27	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.2	65.9	59.8	68.3	68.9
Medium Trucks:	62.5	58.9	51.4	60.1	66.3	66.3
Heavy Trucks:	62.9	59.2	55.8	60.4	66.6	66.7
Vehicle Noise:	70.6	68.3	66.4	64.9	71.9	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	127	274	590
CNEL:	62	134	288	620

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 + P
Road Name: Monroe St.
Road Segment: s/o Av. 56

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,900 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,479 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.12	1.42	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-18.36	1.45	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-22.32	1.45	-1.20	-5.51	0.000	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	69.2	67.9	61.9	70.3	70.9
Medium Trucks:	64.3	60.7	53.2	62.0	68.1	68.2
Heavy Trucks:	64.3	60.6	57.2	61.8	68.0	68.1
Vehicle Noise:	72.5	70.3	68.4	66.7	73.7	74.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	164	353	761
CNEL:	80	172	371	800

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 + P
Road Name: Monroe St.
Road Segment: s/o Av. 58

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,900 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,386 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.41	1.42	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-18.64	1.45	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-22.60	1.45	-1.20	-5.51	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.6	68.9	67.6	61.6	70.0	70.6
Medium Trucks:	64.0	60.4	52.9	61.7	67.9	67.9
Heavy Trucks:	64.0	60.3	56.9	61.6	67.8	67.9
Vehicle Noise:	72.2	70.0	68.1	66.4	73.4	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	157	338	729
CNEL:	77	165	356	766

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: P3 + P
Road Name: Jackson St.
Road Segment: s/o Airport Bl.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,500 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,070 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.53	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-19.77	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-23.72	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.4	64.1	58.0	66.5	67.1
Medium Trucks:	60.5	56.9	49.4	58.1	64.3	64.3
Heavy Trucks:	60.5	56.8	53.4	58.0	64.2	64.3
Vehicle Noise:	68.6	66.4	64.5	62.8	69.9	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	63	136	292	630
CNEL:	66	143	308	663

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 w/Madison
Road Name: Av. 58
Road Segment: w/o Madison St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,116 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.93	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-19.17	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-23.13	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.0	67.3	66.0	60.0	68.4	69.0
Medium Trucks:	62.6	59.0	51.5	60.3	66.4	66.5
Heavy Trucks:	63.0	59.3	55.9	60.6	66.7	66.8
Vehicle Noise:	70.7	68.5	66.5	65.1	72.1	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	60	130	280	604
CNEL:	63	137	294	634

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 w/Madison
Road Name: Av. 58
Road Segment: w/o Jackson St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,600 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,730 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.03	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-17.27	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.22	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.3	67.6	66.3	60.3	68.7	69.3
Medium Trucks:	62.9	59.3	51.8	60.5	66.7	66.7
Heavy Trucks:	63.3	59.6	56.2	60.8	67.0	67.1
Vehicle Noise:	71.0	68.7	66.8	65.3	72.3	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	154	332	715
CNEL:	75	162	349	751

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 w/Madison
Road Name: Av. 58
Road Segment: w/o Monroe St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,200 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	949 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.64	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-19.88	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-23.83	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.3	66.6	65.3	59.3	67.7	68.3
Medium Trucks:	61.9	58.3	50.8	59.6	65.7	65.8
Heavy Trucks:	62.3	58.6	55.2	59.8	66.0	66.1
Vehicle Noise:	70.0	67.8	65.8	64.3	71.4	71.7

Centerline Distance to Noise Contour (in feet)

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

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 w/Madison
Road Name: Madison St.
Road Segment: s/o Av. 56
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,600 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	3,311 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	2.38	1.42	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-14.86	1.45	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-18.82	1.45	-1.20	-5.51	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	74.4	72.7	71.4	65.4	73.8	74.4
Medium Trucks:	67.8	64.2	56.7	65.5	71.6	71.7
Heavy Trucks:	67.8	64.1	60.7	65.4	71.5	71.6
Vehicle Noise:	76.0	73.8	71.9	70.2	77.2	77.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	130	281	604	1,302
CNEL:	137	295	636	1,370

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 w/Madison
Road Name: Av. 60
Road Segment: w/o Jackson St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,116 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.35	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-19.58	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-23.54	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.6	64.2	58.2	66.6	67.3
Medium Trucks:	60.6	57.1	49.6	58.3	64.5	64.5
Heavy Trucks:	60.7	57.0	53.6	58.2	64.4	64.5
Vehicle Noise:	68.8	66.6	64.7	63.0	70.1	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	65	140	301	648
CNEL:	68	147	316	682

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 w/Madison
Road Name: Av. 62
Road Segment: w/o Jackson St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,800 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,841 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.24	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-17.00	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-20.95	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.9	66.6	60.5	69.0	69.6
Medium Trucks:	63.1	59.6	52.1	60.8	67.0	67.0
Heavy Trucks:	63.6	59.8	56.4	61.1	67.3	67.4
Vehicle Noise:	71.3	69.0	67.1	65.6	72.6	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	75	161	346	746
CNEL:	78	169	363	783

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 w/Madison
Road Name: Av. 62
Road Segment: w/o Monroe St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,600 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	893 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	40.084
Medium Trucks:	39.863
Heavy Trucks:	39.885

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.90	1.34	-1.20	-4.60	0.000	0.000
Medium Trucks:	81.00	-20.14	1.37	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-24.10	1.37	-1.20	-5.53	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:	67.4	65.7	64.4	58.4	66.8	67.5
Medium Trucks:	61.0	57.5	50.0	58.7	64.9	64.9
Heavy Trucks:	61.5	57.7	54.3	59.0	65.2	65.3
Vehicle Noise:	69.1	66.9	65.0	63.5	70.5	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	98	210	453
CNEL:	48	102	221	475

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 w/Madison
Road Name: Monroe St.
Road Segment: s/o Av. 60
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,767 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.06	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-17.17	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.13	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.0	69.3	68.0	62.0	70.4	71.0
Medium Trucks:	64.6	61.0	53.5	62.3	68.4	68.5
Heavy Trucks:	65.0	61.3	57.9	62.5	68.7	68.8
Vehicle Noise:	72.7	70.5	68.5	67.0	74.1	74.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	82	177	381	820
CNEL:	86	186	400	861

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 w/Madison
Road Name: Monroe St.
Road Segment: s/o Av. 58

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,418 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	1.01	1.42	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-16.23	1.45	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-20.18	1.45	-1.20	*-5.51*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.0	71.3	70.0	64.0	72.4	73.0
Medium Trucks:	66.4	62.8	55.3	64.1	70.3	70.3
Heavy Trucks:	66.5	62.7	59.3	64.0	70.2	70.3
Vehicle Noise:	74.6	72.4	70.5	68.8	75.9	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	106	228	490	1,056
CNEL:	111	239	516	1,111

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 w/Madison
Road Name: Jackson St.
Road Segment: s/o Airport Bl.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,400 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,641 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	1.40	-0.99	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	82.40	-15.84	-0.97	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-19.80	-0.97	-1.20	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.0	69.3	68.0	62.0	70.4	71.0
Medium Trucks:	64.4	60.8	53.3	62.1	68.2	68.3
Heavy Trucks:	64.4	60.7	57.3	61.9	68.1	68.2
Vehicle Noise:	72.6	70.4	68.5	66.8	73.8	74.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	115	248	534	1,151
CNEL:	121	261	562	1,211

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 w/Madison
Road Name: Monroe St.
Road Segment: s/o Av. 56

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,325 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	0.84	1.42	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-16.40	1.45	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-20.35	1.45	-1.20	*-5.51*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.8	71.1	69.8	63.8	72.2	72.9
Medium Trucks:	66.3	62.7	55.2	63.9	70.1	70.1
Heavy Trucks:	66.3	62.6	59.2	63.8	70.0	70.1
Vehicle Noise:	74.4	72.2	70.3	68.6	75.7	76.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	103	222	478	1,029
CNEL:	108	233	502	1,082

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_1
Road Name: Av. 58
Road Segment: w/o Madison St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,500 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,163 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-1.75	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	81.00	-18.99	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-22.95	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.2	67.5	66.2	60.2	68.6	69.2
Medium Trucks:	62.8	59.2	51.7	60.5	66.6	66.7
Heavy Trucks:	63.2	59.5	56.1	60.7	66.9	67.0
Vehicle Noise:	70.9	68.7	66.7	65.2	72.2	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	62	134	288	621
CNEL:	65	140	302	652

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_1
Road Name: Av. 58
Road Segment: w/o Monroe St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,302 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-1.26	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	81.00	-18.50	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-22.46	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.7	68.0	66.7	60.7	69.1	69.7
Medium Trucks:	63.3	59.7	52.2	60.9	67.1	67.2
Heavy Trucks:	63.7	60.0	56.6	61.2	67.4	67.5
Vehicle Noise:	71.4	69.1	67.2	65.7	72.7	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	67	144	311	669
CNEL:	70	151	326	703

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_1
Road Name: Madison St.
Road Segment: s/o Av. 56

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	3,162 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	2.18	1.42	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-15.06	1.45	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-19.02	1.45	-1.20	*-5.51*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.2	72.5	71.2	65.2	73.6	74.2
Medium Trucks:	67.6	64.0	56.5	65.3	71.4	71.5
Heavy Trucks:	67.6	63.9	60.5	65.2	71.3	71.4
Vehicle Noise:	75.8	73.6	71.7	70.0	77.0	77.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	126	272	586	1,263
CNEL:	133	286	617	1,328

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_1
Road Name: Av. 58
Road Segment: w/o Jackson St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,767 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	0.06	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-17.17	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-21.13	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.4	67.7	66.4	60.4	68.8	69.4
Medium Trucks:	63.0	59.4	51.9	60.6	66.8	66.8
Heavy Trucks:	63.4	59.7	56.3	60.9	67.1	67.2
Vehicle Noise:	71.1	68.8	66.9	65.4	72.4	72.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	73	156	337	725
CNEL:	76	164	354	762

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_1
Road Name: Av. 60
Road Segment: w/o Jackson St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,395 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-1.38	-0.99	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	82.40	-18.62	-0.97	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-22.57	-0.97	-1.20	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.2	66.5	65.2	59.2	67.6	68.2
Medium Trucks:	61.6	58.0	50.5	59.3	65.5	65.5
Heavy Trucks:	61.7	57.9	54.5	59.2	65.4	65.5
Vehicle Noise:	69.8	67.6	65.7	64.0	71.1	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	75	162	349	752
CNEL:	79	170	367	791

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_1
Road Name: Av. 62
Road Segment: w/o Monroe St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,209 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	40.084
Medium Trucks:	39.863
Heavy Trucks:	39.885

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.58	1.34	-1.20	-4.60	0.000	0.000
Medium Trucks:	81.00	-18.82	1.37	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.78	1.37	-1.20	-5.53	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:	68.8	67.1	65.7	59.7	68.2	68.8
Medium Trucks:	62.4	58.8	51.3	60.0	66.2	66.2
Heavy Trucks:	62.8	59.0	55.6	60.3	66.5	66.6
Vehicle Noise:	70.5	68.2	66.3	64.8	71.8	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	119	257	554
CNEL:	58	125	270	582

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_1
Road Name: Monroe St.
Road Segment: s/o Av. 60
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,325 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.26	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-15.98	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-19.94	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.2	70.5	69.2	63.2	71.6	72.2
Medium Trucks:	65.8	62.2	54.7	63.5	69.6	69.7
Heavy Trucks:	66.2	62.5	59.1	63.7	69.9	70.0
Vehicle Noise:	73.9	71.7	69.7	68.2	75.3	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	99	212	457	985
CNEL:	103	223	480	1,034

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_1
Road Name: Av. 62
Road Segment: w/o Jackson St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,767 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.06	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-17.17	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.13	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.4	67.7	66.4	60.4	68.8	69.4
Medium Trucks:	63.0	59.4	51.9	60.6	66.8	66.8
Heavy Trucks:	63.4	59.7	56.3	60.9	67.1	67.2
Vehicle Noise:	71.1	68.8	66.9	65.4	72.4	72.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	156	337	725
CNEL:	76	164	354	762

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_1
Road Name: Monroe St.
Road Segment: s/o Av. 58
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,511 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.18	1.42	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-16.06	1.45	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-20.02	1.45	-1.20	-5.51	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.2	71.5	70.2	64.2	72.6	73.2
Medium Trucks:	66.6	63.0	55.5	64.3	70.4	70.5
Heavy Trucks:	66.6	62.9	59.5	64.1	70.3	70.4
Vehicle Noise:	74.8	72.6	70.7	69.0	76.0	76.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	108	233	503	1,083
CNEL:	114	245	529	1,139

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_1
Road Name: Monroe St.
Road Segment: s/o Av. 56

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,418 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.01	1.42	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-16.23	1.45	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-20.18	1.45	-1.20	-5.51	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.0	71.3	70.0	64.0	72.4	73.0
Medium Trucks:	66.4	62.8	55.3	64.1	70.3	70.3
Heavy Trucks:	66.5	62.7	59.3	64.0	70.2	70.3
Vehicle Noise:	74.6	72.4	70.5	68.8	75.9	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	106	228	490	1,056
CNEL:	111	239	516	1,111

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_2
Road Name: Av. 58
Road Segment: w/o Madison St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,500 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,256 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.42	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-18.66	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.61	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.8	66.5	60.5	68.9	69.5
Medium Trucks:	63.1	59.5	52.0	60.8	67.0	67.0
Heavy Trucks:	63.5	59.8	56.4	61.1	67.3	67.4
Vehicle Noise:	71.2	69.0	67.1	65.6	72.6	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	65	141	303	653
CNEL:	69	148	318	686

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_1
Road Name: Jackson St.
Road Segment: s/o Airport Bl.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,697 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.49	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-15.75	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-19.71	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.1	69.4	68.1	62.1	70.5	71.1
Medium Trucks:	64.5	60.9	53.4	62.1	68.3	68.4
Heavy Trucks:	64.5	60.8	57.4	62.0	68.2	68.3
Vehicle Noise:	72.7	70.5	68.6	66.9	73.9	74.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	117	251	542	1,167
CNEL:	123	264	570	1,228

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_2
Road Name: Av. 58
Road Segment: w/o Monroe St.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,302 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.26	1.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	81.00	-18.50	1.98	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.46	1.98	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	68.0	66.7	60.7	69.1	69.7
Medium Trucks:	63.3	59.7	52.2	60.9	67.1	67.2
Heavy Trucks:	63.7	60.0	56.6	61.2	67.4	67.5
Vehicle Noise:	71.4	69.1	67.2	65.7	72.7	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	67	144	311	669
CNEL:	70	151	326	703

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_2
Road Name: Av. 58
Road Segment: w/o Jackson St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,767 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.06	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-17.17	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-21.13	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.4	67.7	66.4	60.4	68.8	69.4
Medium Trucks:	63.0	59.4	51.9	60.6	66.8	66.8
Heavy Trucks:	63.4	59.7	56.3	60.9	67.1	67.2
Vehicle Noise:	71.1	68.8	66.9	65.4	72.4	72.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	156	337	725
CNEL:	76	164	354	762

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_2
Road Name: Av. 60
Road Segment: w/o Jackson St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,395 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.38	-0.99	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	82.40	-18.62	-0.97	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-22.57	-0.97	-1.20	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.2	66.5	65.2	59.2	67.6	68.2
Medium Trucks:	61.6	58.0	50.5	59.3	65.5	65.5
Heavy Trucks:	61.7	57.9	54.5	59.2	65.4	65.5
Vehicle Noise:	69.8	67.6	65.7	64.0	71.1	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	75	162	349	752
CNEL:	79	170	367	791

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_2
Road Name: Madison St.
Road Segment: s/o Av. 56
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	3,162 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	2.18	1.42	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-15.06	1.45	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-19.02	1.45	-1.20	*-5.51*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	74.2	72.5	71.2	65.2	73.6	74.2
Medium Trucks:	67.6	64.0	56.5	65.3	71.4	71.5
Heavy Trucks:	67.6	63.9	60.5	65.2	71.3	71.4
Vehicle Noise:	75.8	73.6	71.7	70.0	77.0	77.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	126	272	586	1,263
CNEL:	133	286	617	1,328

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_2
Road Name: Av. 62
Road Segment: w/o Monroe St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,302 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	40.084
Medium Trucks:	39.863
Heavy Trucks:	39.885

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.26	1.34	-1.20	*-4.60*	0.000	0.000
Medium Trucks:	81.00	-18.50	1.37	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-22.46	1.37	-1.20	*-5.53*	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:	69.1	67.4	66.1	60.1	68.5	69.1
Medium Trucks:	62.7	59.1	51.6	60.3	66.5	66.5
Heavy Trucks:	63.1	59.4	56.0	60.6	66.8	66.9
Vehicle Noise:	70.8	68.5	66.6	65.1	72.1	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	125	270	582
CNEL:	61	132	284	611

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_2
Road Name: Av. 62
Road Segment: w/o Jackson St.
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	1,767 vehicles
Vehicle Speed:	50 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.06	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-17.17	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-21.13	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.4	67.7	66.4	60.4	68.8	69.4
Medium Trucks:	63.0	59.4	51.9	60.6	66.8	66.8
Heavy Trucks:	63.4	59.7	56.3	60.9	67.1	67.2
Vehicle Noise:	71.1	68.8	66.9	65.4	72.4	72.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	156	337	725
CNEL:	76	164	354	762

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_2
Road Name: Monroe St.
Road Segment: s/o Av. 58
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,511 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.18	1.42	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-16.06	1.45	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-20.02	1.45	-1.20	*-5.51*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.2	71.5	70.2	64.2	72.6	73.2
Medium Trucks:	66.6	63.0	55.5	64.3	70.4	70.5
Heavy Trucks:	66.6	62.9	59.5	64.1	70.3	70.4
Vehicle Noise:	74.8	72.6	70.7	69.0	76.0	76.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	108	233	503	1,083
CNEL:	114	245	529	1,139

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_2
Road Name: Monroe St.
Road Segment: s/o Av. 60
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,325 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	50 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	36.551
Medium Trucks:	36.308
Heavy Trucks:	36.332

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.26	1.94	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	81.00	-15.98	1.98	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-19.94	1.98	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.2	70.5	69.2	63.2	71.6	72.2
Medium Trucks:	65.8	62.2	54.7	63.5	69.6	69.7
Heavy Trucks:	66.2	62.5	59.1	63.7	69.9	70.0
Vehicle Noise:	73.9	71.7	69.7	68.2	75.3	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	99	212	457	985
CNEL:	103	223	480	1,034

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_2
Road Name: Monroe St.
Road Segment: s/o Av. 56
Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,511 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	35 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	43.0 feet
Centerline Dist. to Observer:	43.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	39.595
Medium Trucks:	39.371
Heavy Trucks:	39.393

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.18	1.42	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-16.06	1.45	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-20.02	1.45	-1.20	*-5.51*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.2	71.5	70.2	64.2	72.6	73.2
Medium Trucks:	66.6	63.0	55.5	64.3	70.4	70.5
Heavy Trucks:	66.6	62.9	59.5	64.1	70.3	70.4
Vehicle Noise:	74.8	72.6	70.7	69.0	76.0	76.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	108	233	503	1,083
CNEL:	114	245	529	1,139

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 GPA_2
Road Name: Jackson St.
Road Segment: s/o Airport Bl.

Project Name: Travertine
Job Number: 12189

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,000 vehicles
Peak Hour Percentage:	9.30%
Peak Hour Volume:	2,697 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	1.49	-0.99	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	82.40	-15.75	-0.97	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-19.71	-0.97	-1.20	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.1	69.4	68.1	62.1	70.5	71.1
Medium Trucks:	64.5	60.9	53.4	62.1	68.3	68.4
Heavy Trucks:	64.5	60.8	57.4	62.0	68.2	68.3
Vehicle Noise:	72.7	70.5	68.6	66.9	73.9	74.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	117	251	542	1,167
CNEL:	123	264	570	1,228

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APPENDIX 8.1:

ON-SITE TRAFFIC NOISE CALCULATIONS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: Jefferson Street
Lot No: PA, 1, 2, 3, 6, 7, 10, 18, 19, 11, 12, 14, 15B, 1
Project Name: Travertine
Job Number: 12189
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	560 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	45 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	1.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	72.0 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:	0.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	68.577
Medium Trucks:	68.447
Heavy Trucks:	68.460

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	69.34	-4.47	-2.16	-1.20	-0.99	0.000	0.000
Medium Trucks:	77.62	-21.71	-2.15	-1.20	-1.15	0.000	0.000
Heavy Trucks:	82.14	-25.66	-2.15	-1.20	-1.60	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.5	59.6	57.8	51.8	60.4	61.0
Medium Trucks:	52.6	51.1	44.7	43.2	51.6	51.8
Heavy Trucks:	53.1	51.7	42.7	43.9	52.3	52.4
Vehicle Noise:	62.6	60.8	58.2	52.9	61.5	62.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.5	59.6	57.8	51.8	60.4	61.0
Medium Trucks:	52.6	51.1	44.7	43.2	51.6	51.8
Heavy Trucks:	53.1	51.7	42.7	43.9	52.3	52.4
Vehicle Noise:	62.6	60.8	58.2	52.9	61.5	62.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: South Loop
Lot No: PA 12, 13, 15A, 15B, 16, 14
Project Name: Travertine
Job Number: 12189
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

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

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	45.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	0.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	39.291
Medium Trucks:	39.065
Heavy Trucks:	39.087

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	69.34	-7.64	1.47	-1.20	-0.88	0.000	0.000
Medium Trucks:	77.62	-24.88	1.50	-1.20	-1.15	0.000	0.000
Heavy Trucks:	82.14	-28.83	1.50	-1.20	-1.94	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.0	60.1	58.3	52.3	60.9	61.5
Medium Trucks:	53.1	51.5	45.2	43.6	52.1	52.3
Heavy Trucks:	53.6	52.2	43.2	44.4	52.8	52.9
Vehicle Noise:	63.0	61.2	58.6	53.4	62.0	62.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.0	60.1	58.3	52.3	60.9	61.5
Medium Trucks:	53.1	51.5	45.2	43.6	52.1	52.3
Heavy Trucks:	53.6	52.2	43.2	44.4	52.8	52.9
Vehicle Noise:	63.0	61.2	58.6	53.4	62.0	62.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: North Loop
Lot No: PA 3, 4, 5, 8, 10, 7, 6
Project Name: Travertine
Job Number: 12189
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	200 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	45 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	1.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	45.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	0.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	39.291
Medium Trucks:	39.065
Heavy Trucks:	39.087

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	69.34	-8.94	1.47	-1.20	-0.88	0.000	0.000
Medium Trucks:	77.62	-26.18	1.50	-1.20	-1.15	0.000	0.000
Heavy Trucks:	82.14	-30.13	1.50	-1.20	-1.94	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.7	58.8	57.0	51.0	59.6	60.2
Medium Trucks:	51.7	50.2	43.9	42.3	50.8	51.0
Heavy Trucks:	52.3	50.9	41.8	43.1	51.5	51.6
Vehicle Noise:	61.7	59.9	57.3	52.1	60.7	61.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.7	58.8	57.0	51.0	59.6	60.2
Medium Trucks:	51.7	50.2	43.9	42.3	50.8	51.0
Heavy Trucks:	52.3	50.9	41.8	43.1	51.5	51.6
Vehicle Noise:	61.7	59.9	57.3	52.1	60.7	61.2

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: Jefferson Street
Lot No: PA, 1, 2, 3, 6, 7, 10, 18, 19, 11, 12, 14, 15B, 1
Project Name: Travertine
Job Number: 12189
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	560 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	45 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	1.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	72.0 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:	0.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	68.577
Medium Trucks:	68.447
Heavy Trucks:	68.460

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	69.34	-4.47	-2.16	-1.20	-0.99	0.000	0.000
Medium Trucks:	77.62	-21.71	-2.15	-1.20	-1.15	0.000	0.000
Heavy Trucks:	82.14	-25.66	-2.15	-1.20	-1.60	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.5	59.6	57.8	51.8	60.4	61.0
Medium Trucks:	52.6	51.1	44.7	43.2	51.6	51.8
Heavy Trucks:	53.1	51.7	42.7	43.9	52.3	52.4
Vehicle Noise:	62.6	60.8	58.2	52.9	61.5	62.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.5	59.6	57.8	51.8	60.4	61.0
Medium Trucks:	52.6	51.1	44.7	43.2	51.6	51.8
Heavy Trucks:	53.1	51.7	42.7	43.9	52.3	52.4
Vehicle Noise:	62.6	60.8	58.2	52.9	61.5	62.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: North Loop
Lot No: PA 3, 4, 5, 8, 10, 7, 6

Project Name: Travertine
Job Number: 12189
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	200 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	45 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	1.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	45.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	0.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	39.291
Medium Trucks:	39.065
Heavy Trucks:	39.087

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	69.34	-8.94	1.47	-1.20	-0.88	0.000	0.000
Medium Trucks:	77.62	-26.18	1.50	-1.20	-1.15	0.000	0.000
Heavy Trucks:	82.14	-30.13	1.50	-1.20	-1.94	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.7	58.8	57.0	51.0	59.6	60.2
Medium Trucks:	51.7	50.2	43.9	42.3	50.8	51.0
Heavy Trucks:	52.3	50.9	41.8	43.1	51.5	51.6
Vehicle Noise:	61.7	59.9	57.3	52.1	60.7	61.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.7	58.8	57.0	51.0	59.6	60.2
Medium Trucks:	51.7	50.2	43.9	42.3	50.8	51.0
Heavy Trucks:	52.3	50.9	41.8	43.1	51.5	51.6
Vehicle Noise:	61.7	59.9	57.3	52.1	60.7	61.2

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: Jefferson Street
Lot No: PA, 1, 2, 3, 6, 7, 10, 18, 19, 11, 12, 14, 15B, 1

Project Name: Travertine
Job Number: 12189
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	560 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	45 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	1.0
Centerline Dist. to Barrier:	62.0 feet
Centerline Dist. to Observer:	72.0 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:	0.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	69.812
Medium Trucks:	69.388
Heavy Trucks:	68.656

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	69.34	-4.47	-2.28	-1.20	-5.73	0.000	0.000
Medium Trucks:	77.62	-21.71	-2.24	-1.20	-6.17	0.000	0.000
Heavy Trucks:	82.14	-25.66	-2.17	-1.20	-7.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.4	59.5	57.7	51.7	60.3	60.9
Medium Trucks:	52.5	51.0	44.6	43.1	51.5	51.8
Heavy Trucks:	53.1	51.7	42.7	43.9	52.3	52.4
Vehicle Noise:	62.5	60.7	58.1	52.8	61.4	61.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.4	59.5	57.7	51.7	60.3	60.9
Medium Trucks:	52.5	51.0	44.6	43.1	51.5	51.8
Heavy Trucks:	53.1	51.7	42.7	43.9	52.3	52.4
Vehicle Noise:	62.5	60.7	58.1	52.8	61.4	61.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: South Loop
Lot No: PA 12, 13, 15A, 15B, 16, 14

Project Name: Travertine
Job Number: 12189
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

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

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	45.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	0.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	39.291
Medium Trucks:	39.065
Heavy Trucks:	39.087

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	69.34	-7.64	1.47	-1.20	-0.88	0.000	0.000
Medium Trucks:	77.62	-24.88	1.50	-1.20	-1.15	0.000	0.000
Heavy Trucks:	82.14	-28.83	1.50	-1.20	-1.94	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.0	60.1	58.3	52.3	60.9	61.5
Medium Trucks:	53.1	51.5	45.2	43.6	52.1	52.3
Heavy Trucks:	53.6	52.2	43.2	44.4	52.8	52.9
Vehicle Noise:	63.0	61.2	58.6	53.4	62.0	62.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.0	60.1	58.3	52.3	60.9	61.5
Medium Trucks:	53.1	51.5	45.2	43.6	52.1	52.3
Heavy Trucks:	53.6	52.2	43.2	44.4	52.8	52.9
Vehicle Noise:	63.0	61.2	58.6	53.4	62.0	62.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: North Loop
Lot No: PA 3, 4, 5, 8, 10, 7, 6

Project Name: Travertine
Job Number: 12189
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	200 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	45 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	1.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	45.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	0.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	41.410
Medium Trucks:	40.690
Heavy Trucks:	39.429

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	69.34	-8.94	1.12	-1.20	-4.97	0.000	0.000
Medium Trucks:	77.62	-26.18	1.24	-1.20	-5.66	0.000	0.000
Heavy Trucks:	82.14	-30.13	1.44	-1.20	-7.54	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.3	58.4	56.7	50.6	59.2	59.8
Medium Trucks:	51.5	50.0	43.6	42.1	50.5	50.8
Heavy Trucks:	52.3	50.8	41.8	43.0	51.4	51.5
Vehicle Noise:	61.4	59.6	57.0	51.8	60.4	60.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.3	58.4	56.7	50.6	59.2	59.8
Medium Trucks:	51.5	50.0	43.6	42.1	50.5	50.8
Heavy Trucks:	52.3	50.8	41.8	43.0	51.4	51.5
Vehicle Noise:	61.4	59.6	57.0	51.8	60.4	60.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario:	Second Floor With Wall	*Project Name:*	Travertine
Road Name:	South Loop	*Job Number:*	12189
Lot No:	PA 12, 13, 15A, 15B, 16, 14	*Analyst:*	B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

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

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	45.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	0.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	41.410
Medium Trucks:	40.690
Heavy Trucks:	39.429

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	-7.64	1.12	-1.20	*-4.97*	0.000	0.000
Medium Trucks:	77.62	-24.88	1.24	-1.20	*-5.66*	0.000	0.000
Heavy Trucks:	82.14	-28.83	1.44	-1.20	*-7.54*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.6	59.7	58.0	51.9	60.5	61.1
Medium Trucks:	52.8	51.3	44.9	43.4	51.8	52.1
Heavy Trucks:	53.6	52.1	43.1	44.3	52.7	52.8
Vehicle Noise:	62.7	60.9	58.3	53.1	61.7	62.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.6	59.7	58.0	51.9	60.5	61.1
Medium Trucks:	52.8	51.3	44.9	43.4	51.8	52.1
Heavy Trucks:	53.6	52.1	43.1	44.3	52.7	52.8
Vehicle Noise:	62.7	60.9	58.3	53.1	61.7	62.2

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APPENDIX 10.1:

CADNAA TYPICAL CONSTRUCTION NOISE MODEL INPUTS

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12189 - Travertine

CadnaA Noise Prediction Model: 12189-07.cna
Date: 22.12.20
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
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	1.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
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)
RECEIVERS		R1	40.9	40.9	47.6	80.0	0.0	0.0				5.00	r	6555964.14	2169740.41	67.86
RECEIVERS		R2	-80.2	-80.2	-73.5	80.0	0.0	0.0				5.00	r	6557967.61	2172101.52	-9.22
RECEIVERS		R3	-80.2	-80.2	-73.5	80.0	0.0	0.0				5.00	r	6561754.93	2171246.33	-40.66
RECEIVERS		R4	54.5	54.5	61.2	80.0	0.0	0.0				5.00	r	6559958.82	2166412.26	-1.72
RECEIVERS		R5	58.7	58.7	65.4	80.0	0.0	0.0				5.00	r	6562790.49	2161683.43	-1.68
RECEIVERS		R6	54.2	54.2	60.9	80.0	0.0	0.0				5.00	r	6564639.43	2159506.53	-32.11

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)		
SITEBOUNDARY		CONSTRUCTION	144.4	144.4	144.4	79.0	79.0	79.0	Lw"	79					8	r

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	8.00	r			6557474.85	2165230.62	133.60	125.60
					6557474.20	2165129.27	150.41	142.41
					6557883.26	2165131.98	115.03	107.03
					6557883.75	2165230.48	89.77	81.77
					6558271.81	2165231.55	76.33	68.33

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
			6558270.94	2164564.46	139.42	131.42
			6558802.50	2164566.08	103.25	95.25
			6558796.74	2163251.00	115.81	107.81
			6559459.94	2163253.81	96.57	88.57
			6559459.21	2162917.71	99.59	91.59
			6559799.65	2162920.42	88.71	80.71
			6559796.74	2161922.79	98.79	90.79
			6561086.58	2161930.74	56.12	48.12
			6561311.82	2162210.24	44.19	36.19
			6561310.23	2162595.46	40.57	32.57
			6561410.19	2162596.22	36.98	28.98
			6561404.77	2163927.70	23.70	15.70
			6561541.08	2163924.21	19.07	11.07
			6561519.93	2161356.85	44.58	36.58
			6561568.66	2161282.21	43.81	35.81
			6561570.07	2156005.90	70.02	62.02
			6560035.35	2156012.03	165.81	157.81
			6560029.97	2156314.24	141.67	133.67
			6559769.26	2156836.46	160.92	152.92
			6559488.08	2157706.80	157.38	149.38
			6558577.28	2158256.18	208.00	200.00
			6557995.75	2158218.92	276.26	268.26
			6557672.46	2158146.59	279.30	271.30
			6557461.88	2157955.45	313.26	305.26
			6557249.12	2157675.52	324.10	316.10
			6556981.43	2157675.56	314.52	306.52
			6556665.22	2157582.01	328.00	320.00
			6556500.09	2157415.46	347.87	339.87
			6556315.37	2156980.55	400.19	392.19
			6556322.02	2157341.66	328.00	320.00
			6554981.69	2157343.49	438.69	430.69
			6554977.85	2158651.10	352.05	344.05
			6555633.34	2158649.77	328.00	320.00
			6555631.15	2159309.74	310.89	302.89
			6555958.51	2159307.06	292.71	284.71
			6555953.86	2159968.76	286.44	278.44
			6555628.96	2159969.67	302.30	294.30
			6555626.82	2160615.13	278.12	270.12
			6555949.34	2160612.27	264.42	256.42
			6555945.01	2161230.04	248.00	240.00
			6556178.53	2161289.95	246.12	238.12
			6556183.51	2165229.24	201.03	193.03

Barrier(s)

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
			left	right		horz.	vert.	Begin		End	x	y	z	Ground
					(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
BARRIERS		BARRIERS00001						6.00	r		6554312.67	2169302.04	118.57	112.57
											6554642.53	2169343.28	108.26	102.26
											6554748.86	2169323.75	104.46	98.46
											6554885.58	2169319.41	97.99	91.99
											6555007.11	2169341.11	91.08	85.08
											6555178.55	2169360.64	83.74	77.74
											6555423.78	2169364.98	80.05	74.05
											6555703.72	2169362.81	82.82	76.82
											6555881.68	2169371.49	84.15	78.15
											6556005.37	2169427.91	82.87	76.87
											6556061.80	2169497.36	80.39	74.39
											6556068.31	2169634.08	74.45	68.45
											6556096.52	2170272.10	40.65	34.65
											6556063.97	2170369.75	37.47	31.47
											6556005.37	2170452.22	34.93	28.93
											6555927.25	2170523.83	33.74	27.74
											6555812.23	2170591.11	34.28	28.28
											6555649.47	2170643.19	35.98	29.98
											6555423.78	2170671.40	37.67	31.67
											6555211.10	2170745.19	39.72	33.72
											6555054.85	2170842.84	38.33	32.33
BARRIERS		BARRIERS00002						6.00	r		6556556.73	2172112.09	4.73	-1.27
											6556545.88	2172060.00	5.11	-0.89
											6556530.69	2172051.32	5.30	-0.70
											6556135.73	2172053.49	6.00	0.00
BARRIERS		BARRIERS00003						6.00	r		6556775.92	2172055.66	3.01	-2.99
											6557090.59	2172053.49	0.12	-5.88
											6557168.71	2172086.04	-0.77	-6.77
											6557272.88	2172159.83	-2.13	-8.13

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
			left	right		horz.	vert.	Begin		End	x	y	z	Ground
					(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
BARRIERS		BARRIERS00004						6.00	r		6557474.70	2172051.32	-3.41	-9.41
											6557496.40	2172040.47	-3.55	-9.55
											6557758.99	2172033.96	-5.94	-11.94
											6557802.39	2172062.17	-6.49	-12.49
BARRIERS		BARRIERS00005						6.00	r		6557897.88	2172135.96	-7.76	-13.76
											6557921.75	2172079.53	-7.68	-13.68
											6557980.35	2172031.79	-7.97	-13.97
											6558670.45	2172038.30	-14.36	-20.36
											6558750.74	2172135.96	-15.63	-21.63
											6558746.40	2172305.23	-16.19	-22.19
BARRIERS		BARRIERS00006						6.00	r		6558796.32	2172159.83	-16.17	-22.17
											6558935.21	2172151.15	-17.41	-23.41
											6558956.91	2172114.26	-17.41	-23.41
											6559024.18	2172086.04	-17.88	-23.88
BARRIERS		BARRIERS00007						6.00	r		6559453.87	2172083.87	-21.83	-27.83
											6559579.74	2172075.19	-22.95	-28.95
BARRIERS		BARRIERS00008						6.00	r		6559653.52	2172075.19	-23.63	-29.63
											6559781.56	2172073.02	-24.80	-30.80
BARRIERS		BARRIERS00009						6.00	r		6559785.90	2172075.19	-24.85	-30.85
											6559790.24	2172036.13	-24.68	-30.68
											6560057.17	2172036.13	-27.14	-33.14
											6560085.38	2172057.83	-27.52	-33.52
											6560083.21	2172122.94	-27.67	-33.67
BARRIERS		BARRIERS00010						6.00	r		6560159.16	2172129.45	-28.28	-34.28
											6560159.16	2172055.66	-28.19	-34.19
											6560187.38	2172027.45	-28.29	-34.29
											6560289.37	2172036.13	-29.28	-35.28
BARRIERS		BARRIERS00011						6.00	r		6560332.78	2172031.79	-29.66	-35.66
											6560462.98	2172036.13	-30.88	-36.88
											6560460.81	2172053.49	-30.96	-36.96
											6560554.13	2172055.66	-31.72	-37.72
BARRIERS		BARRIERS00012						6.00	r		6560645.28	2172081.70	-32.40	-38.40
											6560760.29	2172079.53	-33.36	-39.36
											6560768.97	2172053.49	-33.50	-39.50
											6561098.83	2172051.32	-35.08	-41.08
											6561105.35	2172038.30	-35.13	-41.13
											6561357.08	2172036.13	-36.34	-42.34
											6561363.59	2172626.41	-35.50	-41.50
BARRIERS		BARRIERS00013						6.00	r		6561513.20	2173171.81	-34.85	-40.85
											6561510.59	2172052.02	-37.02	-43.02
											6562653.82	2172025.98	-41.89	-47.89
											6562713.72	2172052.02	-41.99	-47.99
											6562760.59	2172075.46	-42.05	-48.05
											6562773.61	2172190.04	-41.81	-47.81
BARRIERS		BARRIERS00014						6.00	r		6562247.57	2171908.79	-40.71	-46.71
											6562132.99	2171882.75	-40.20	-46.20
											6562031.42	2171809.84	-39.87	-45.87
											6562073.09	2171757.75	-40.17	-46.17
											6561747.57	2171525.98	-39.31	-45.31
											6561661.63	2171450.46	-38.93	-44.93
											6561604.34	2171330.67	-38.72	-44.72
											6561609.55	2171203.06	-39.01	-45.01
											6561703.30	2171020.77	-39.68	-45.68
											6561744.97	2170893.17	-39.90	-45.90
											6561833.51	2170752.54	-40.36	-46.36
											6561896.01	2170664.00	-40.68	-46.68
											6561950.70	2170536.40	-40.81	-46.81
											6562057.47	2170458.27	-41.56	-47.56
											6562174.65	2170429.63	-42.51	-48.51
BARRIERS		BARRIERS00015						6.00	r		6562122.57	2170265.56	-42.40	-48.40
											6562135.59	2170101.50	-42.78	-48.78
											6562190.28	2169921.81	-43.51	-49.51
											6562239.76	2169619.73	-44.42	-50.42
											6562268.40	2169226.50	-44.91	-50.91
											6562273.61	2168940.04	-44.90	-50.90
											6562231.95	2168762.96	-44.45	-50.45
											6562143.40	2168598.90	-43.55	-49.55
											6562007.99	2168140.56	-41.91	-47.91
											6561898.61	2167968.69	-41.07	-47.07
											6561734.55	2167700.46	-38.87	-44.87
											6561630.38	2167463.48	-36.76	-42.76
											6561531.42	2167169.21	-33.91	-39.91
											6561502.78	2166695.25	-25.66	-31.66
											6561547.05	2166674.42	-25.96	-31.96
											6561888.20	2166679.63	-31.23	-37.23
											6561843.92	2166716.09	-31.26	-37.26
BARRIERS		BARRIERS00016						6.00	r		6561893.40	2166765.56	-32.80	-38.80

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
			left	right		horz.	vert.	Begin		End	x	y	z	Ground
					(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
											6562119.97	2166679.63	-34.03	-40.03
											6562343.92	2166666.61	-36.00	-42.00
											6562612.15	2166679.63	-38.75	-44.75
											6563122.57	2166679.63	-44.66	-50.66
											6563507.99	2166679.63	-49.33	-55.33
											6564159.03	2166679.63	-55.46	-61.46
											6565481.95	2166716.09	-61.95	-67.95
											6566036.63	2166697.86	-64.69	-70.69
											6566382.99	2166713.48	-66.38	-72.38
											6566640.80	2166695.25	-67.66	-73.66
											6566630.38	2167684.84	-65.72	-71.72
											6566599.13	2168093.69	-64.56	-70.56
											6566651.22	2168367.13	-63.97	-69.97
											6566659.03	2169080.67	-62.59	-68.59
											6566638.20	2169150.98	-62.34	-68.34
BARRIERS		BARRIERS00017						6.00	r		6561814.39	2166114.32	-20.57	-26.57
											6561689.39	2165954.59	-16.10	-22.10
											6561613.00	2165600.43	-9.95	-15.95
											6561557.44	2165246.26	-2.78	-8.78
											6561585.22	2165024.04	1.09	-4.91
											6561675.50	2164829.59	1.95	-4.05
											6561967.16	2164225.43	2.70	-3.30
											6562203.28	2163510.15	1.34	-4.66
											6562279.67	2163301.82	1.50	-4.50
											6562765.78	2163280.98	-9.00	-15.00
											6562758.83	2161655.98	0.41	-5.59
											6563182.44	2161600.43	-10.31	-16.31
											6563210.22	2161385.15	-10.09	-16.09
											6564703.28	2161378.21	-45.82	-51.82
											6564779.66	2161482.37	-47.33	-53.33
											6564967.17	2161482.37	-50.65	-56.65
											6564967.17	2161343.48	-50.18	-56.18
											6566501.89	2161357.37	-69.14	-75.14
											6566529.67	2161510.15	-69.53	-75.53
											6566661.61	2161510.15	-71.02	-77.02
BARRIERS		BARRIERS00018						6.00	r		6560578.28	2166544.87	-10.26	-16.26
											6560494.94	2166419.87	-6.96	-12.96
											6560696.33	2166287.93	-7.32	-13.32
											6560751.89	2166371.26	-9.50	-15.50

APPENDIX 10.2:

CADNAA ROCK CRUSHING NOISE MODEL INPUTS

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12189 - Travertine

CadnaA Noise Prediction Model: 12189-07_RockCrushing.cna
Date: 22.12.20
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
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	0.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
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)
RECEIVERS		R1	56.4	56.4	63.1	80.0	0.0	0.0				5.00	r	6555964.14	2169740.41	67.86
RECEIVERS		R2	-80.2	-80.2	-73.5	80.0	0.0	0.0				5.00	r	6557967.61	2172101.52	-9.22
RECEIVERS		R3	-80.2	-80.2	-73.5	80.0	0.0	0.0				5.00	r	6561754.93	2171246.33	-40.66
RECEIVERS		R4	70.0	70.0	76.6	80.0	0.0	0.0				5.00	r	6559958.82	2166412.26	-1.72
RECEIVERS		R5	74.0	74.0	80.7	80.0	0.0	0.0				5.00	r	6562790.49	2161683.43	-1.68
RECEIVERS		R6	69.7	69.7	76.3	80.0	0.0	0.0				5.00	r	6564639.43	2159506.53	-32.11

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)		
SITEBOUNDARY		CONSTRUCTION	148.4	148.4	148.4	83.0	83.0	83.0	Lw"	83					8	r

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	8.00	r			6557474.85	2165230.62	133.60	125.60
					6557474.20	2165129.27	150.41	142.41
					6557883.26	2165131.98	115.03	107.03
					6557883.75	2165230.48	89.77	81.77
					6558271.81	2165231.55	76.33	68.33

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
			6558270.94	2164564.46	139.42	131.42
			6558802.50	2164566.08	103.25	95.25
			6558796.74	2163251.00	115.81	107.81
			6559459.94	2163253.81	96.57	88.57
			6559459.21	2162917.71	99.59	91.59
			6559799.65	2162920.42	88.71	80.71
			6559796.74	2161922.79	98.79	90.79
			6561086.58	2161930.74	56.12	48.12
			6561311.82	2162210.24	44.19	36.19
			6561310.23	2162595.46	40.57	32.57
			6561410.19	2162596.22	36.98	28.98
			6561404.77	2163927.70	23.70	15.70
			6561541.08	2163924.21	19.07	11.07
			6561519.93	2161356.85	44.58	36.58
			6561568.66	2161282.21	43.81	35.81
			6561570.07	2156005.90	70.02	62.02
			6560035.35	2156012.03	165.81	157.81
			6560029.97	2156314.24	141.67	133.67
			6559769.26	2156836.46	160.92	152.92
			6559488.08	2157706.80	157.38	149.38
			6558577.28	2158256.18	208.00	200.00
			6557995.75	2158218.92	276.26	268.26
			6557672.46	2158146.59	279.30	271.30
			6557461.88	2157955.45	313.26	305.26
			6557249.12	2157675.52	324.10	316.10
			6556981.43	2157675.56	314.52	306.52
			6556665.22	2157582.01	328.00	320.00
			6556500.09	2157415.46	347.87	339.87
			6556315.37	2156980.55	400.19	392.19
			6556322.02	2157341.66	328.00	320.00
			6554981.69	2157343.49	438.69	430.69
			6554977.85	2158651.10	352.05	344.05
			6555633.34	2158649.77	328.00	320.00
			6555631.15	2159309.74	310.89	302.89
			6555958.51	2159307.06	292.71	284.71
			6555953.86	2159968.76	286.44	278.44
			6555628.96	2159969.67	302.30	294.30
			6555626.82	2160615.13	278.12	270.12
			6555949.34	2160612.27	264.42	256.42
			6555945.01	2161230.04	248.00	240.00
			6556178.53	2161289.95	246.12	238.12
			6556183.51	2165229.24	201.03	193.03

Barrier(s)

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
			left	right		horz.	vert.	Begin		End	x	y	z	Ground
					(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
BARRIERS		BARRIERS00001						6.00	r		6554312.67	2169302.04	118.57	112.57
											6554642.53	2169343.28	108.26	102.26
											6554748.86	2169323.75	104.46	98.46
											6554885.58	2169319.41	97.99	91.99
											6555007.11	2169341.11	91.08	85.08
											6555178.55	2169360.64	83.74	77.74
											6555423.78	2169364.98	80.05	74.05
											6555703.72	2169362.81	82.82	76.82
											6555881.68	2169371.49	84.15	78.15
											6556005.37	2169427.91	82.87	76.87
											6556061.80	2169497.36	80.39	74.39
											6556068.31	2169634.08	74.45	68.45
											6556096.52	2170272.10	40.65	34.65
											6556063.97	2170369.75	37.47	31.47
											6556005.37	2170452.22	34.93	28.93
											6555927.25	2170523.83	33.74	27.74
											6555812.23	2170591.11	34.28	28.28
											6555649.47	2170643.19	35.98	29.98
											6555423.78	2170671.40	37.67	31.67
											6555211.10	2170745.19	39.72	33.72
											6555054.85	2170842.84	38.33	32.33
BARRIERS		BARRIERS00002						6.00	r		6556556.73	2172112.09	4.73	-1.27
											6556545.88	2172060.00	5.11	-0.89
											6556530.69	2172051.32	5.30	-0.70
											6556135.73	2172053.49	6.00	0.00
BARRIERS		BARRIERS00003						6.00	r		6556775.92	2172055.66	3.01	-2.99
											6557090.59	2172053.49	0.12	-5.88
											6557168.71	2172086.04	-0.77	-6.77
											6557272.88	2172159.83	-2.13	-8.13

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
			left	right		horz.	vert.	Begin		End	x	y	z	Ground
					(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
BARRIERS		BARRIERS00004						6.00	r		6557474.70	2172051.32	-3.41	-9.41
											6557496.40	2172040.47	-3.55	-9.55
											6557758.99	2172033.96	-5.94	-11.94
											6557802.39	2172062.17	-6.49	-12.49
BARRIERS		BARRIERS00005						6.00	r		6557897.88	2172135.96	-7.76	-13.76
											6557921.75	2172079.53	-7.68	-13.68
											6557980.35	2172031.79	-7.97	-13.97
											6558670.45	2172038.30	-14.36	-20.36
											6558750.74	2172135.96	-15.63	-21.63
											6558746.40	2172305.23	-16.19	-22.19
BARRIERS		BARRIERS00006						6.00	r		6558796.32	2172159.83	-16.17	-22.17
											6558935.21	2172151.15	-17.41	-23.41
											6558956.91	2172114.26	-17.41	-23.41
											6559024.18	2172086.04	-17.88	-23.88
BARRIERS		BARRIERS00007						6.00	r		6559453.87	2172083.87	-21.83	-27.83
											6559579.74	2172075.19	-22.95	-28.95
BARRIERS		BARRIERS00008						6.00	r		6559653.52	2172075.19	-23.63	-29.63
											6559781.56	2172073.02	-24.80	-30.80
BARRIERS		BARRIERS00009						6.00	r		6559785.90	2172075.19	-24.85	-30.85
											6559790.24	2172036.13	-24.68	-30.68
											6560057.17	2172036.13	-27.14	-33.14
											6560085.38	2172057.83	-27.52	-33.52
											6560083.21	2172122.94	-27.67	-33.67
BARRIERS		BARRIERS00010						6.00	r		6560159.16	2172129.45	-28.28	-34.28
											6560159.16	2172055.66	-28.19	-34.19
											6560187.38	2172027.45	-28.29	-34.29
											6560289.37	2172036.13	-29.28	-35.28
BARRIERS		BARRIERS00011						6.00	r		6560332.78	2172031.79	-29.66	-35.66
											6560462.98	2172036.13	-30.88	-36.88
											6560460.81	2172053.49	-30.96	-36.96
											6560554.13	2172055.66	-31.72	-37.72
BARRIERS		BARRIERS00012						6.00	r		6560645.28	2172081.70	-32.40	-38.40
											6560760.29	2172079.53	-33.36	-39.36
											6560768.97	2172053.49	-33.50	-39.50
											6561098.83	2172051.32	-35.08	-41.08
											6561105.35	2172038.30	-35.13	-41.13
											6561357.08	2172036.13	-36.34	-42.34
											6561363.59	2172626.41	-35.50	-41.50
BARRIERS		BARRIERS00013						6.00	r		6561513.20	2173171.81	-34.85	-40.85
											6561510.59	2172052.02	-37.02	-43.02
											6562653.82	2172025.98	-41.89	-47.89
											6562713.72	2172052.02	-41.99	-47.99
											6562760.59	2172075.46	-42.05	-48.05
											6562773.61	2172190.04	-41.81	-47.81
BARRIERS		BARRIERS00014						6.00	r		6562247.57	2171908.79	-40.71	-46.71
											6562132.99	2171882.75	-40.20	-46.20
											6562031.42	2171809.84	-39.87	-45.87
											6562073.09	2171757.75	-40.17	-46.17
											6561747.57	2171525.98	-39.31	-45.31
											6561661.63	2171450.46	-38.93	-44.93
											6561604.34	2171330.67	-38.72	-44.72
											6561609.55	2171203.06	-39.01	-45.01
											6561703.30	2171020.77	-39.68	-45.68
											6561744.97	2170893.17	-39.90	-45.90
											6561833.51	2170752.54	-40.36	-46.36
											6561896.01	2170664.00	-40.68	-46.68
											6561950.70	2170536.40	-40.81	-46.81
											6562057.47	2170458.27	-41.56	-47.56
											6562174.65	2170429.63	-42.51	-48.51
BARRIERS		BARRIERS00015						6.00	r		6562122.57	2170265.56	-42.40	-48.40
											6562135.59	2170101.50	-42.78	-48.78
											6562190.28	2169921.81	-43.51	-49.51
											6562239.76	2169619.73	-44.42	-50.42
											6562268.40	2169226.50	-44.91	-50.91
											6562273.61	2168940.04	-44.90	-50.90
											6562231.95	2168762.96	-44.45	-50.45
											6562143.40	2168598.90	-43.55	-49.55
											6562007.99	2168140.56	-41.91	-47.91
											6561898.61	2167968.69	-41.07	-47.07
											6561734.55	2167700.46	-38.87	-44.87
											6561630.38	2167463.48	-36.76	-42.76
											6561531.42	2167169.21	-33.91	-39.91
											6561502.78	2166695.25	-25.66	-31.66
											6561547.05	2166674.42	-25.96	-31.96
											6561888.20	2166679.63	-31.23	-37.23
											6561843.92	2166716.09	-31.26	-37.26
BARRIERS		BARRIERS00016						6.00	r		6561893.40	2166765.56	-32.80	-38.80

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
			left	right		horz.	vert.	Begin		End	x	y	z	Ground
					(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
											6562119.97	2166679.63	-34.03	-40.03
											6562343.92	2166666.61	-36.00	-42.00
											6562612.15	2166679.63	-38.75	-44.75
											6563122.57	2166679.63	-44.66	-50.66
											6563507.99	2166679.63	-49.33	-55.33
											6564159.03	2166679.63	-55.46	-61.46
											6565481.95	2166716.09	-61.95	-67.95
											6566036.63	2166697.86	-64.69	-70.69
											6566382.99	2166713.48	-66.38	-72.38
											6566640.80	2166695.25	-67.66	-73.66
											6566630.38	2167684.84	-65.72	-71.72
											6566599.13	2168093.69	-64.56	-70.56
											6566651.22	2168367.13	-63.97	-69.97
											6566659.03	2169080.67	-62.59	-68.59
											6566638.20	2169150.98	-62.34	-68.34
BARRIERS		BARRIERS00017						6.00	r		6561814.39	2166114.32	-20.57	-26.57
											6561689.39	2165954.59	-16.10	-22.10
											6561613.00	2165600.43	-9.95	-15.95
											6561557.44	2165246.26	-2.78	-8.78
											6561585.22	2165024.04	1.09	-4.91
											6561675.50	2164829.59	1.95	-4.05
											6561967.16	2164225.43	2.70	-3.30
											6562203.28	2163510.15	1.34	-4.66
											6562279.67	2163301.82	1.50	-4.50
											6562765.78	2163280.98	-9.00	-15.00
											6562758.83	2161655.98	0.41	-5.59
											6563182.44	2161600.43	-10.31	-16.31
											6563210.22	2161385.15	-10.09	-16.09
											6564703.28	2161378.21	-45.82	-51.82
											6564779.66	2161482.37	-47.33	-53.33
											6564967.17	2161482.37	-50.65	-56.65
											6564967.17	2161343.48	-50.18	-56.18
											6566501.89	2161357.37	-69.14	-75.14
											6566529.67	2161510.15	-69.53	-75.53
											6566661.61	2161510.15	-71.02	-77.02
BARRIERS		BARRIERS00018						6.00	r		6560578.28	2166544.87	-10.26	-16.26
											6560494.94	2166419.87	-6.96	-12.96
											6560696.33	2166287.93	-7.32	-13.32
											6560751.89	2166371.26	-9.50	-15.50

APPENDIX 10.3:

WATER WELL CONSTRUCTION PHOTOS

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