APPENDIX K: NOISE IMPACT ANALYSIS

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Covina Bowl

NOISE IMPACT ANALYSIS

CITY OF COVINA

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
PPV	Peak Particle Velocity
Project	Covina Bowl
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 Covina Bowl ("Project"). The Project site is located south of San Bernardino Road and west of Rimsdale Avenue in the City of Covina. The Project consists of the construction of up to 132 residential townhome units and the restoration of the original 1955 building for re-occupancy as a 12,000 square-foot office/coffee shop space. This study has been prepared consistent with applicable City of Covina noise standards, and significance criteria based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

OFF-SITE NOISE ANALYSIS

Traffic generated by the operation of the proposed Project will influence the traffic noise levels in surrounding off-site areas. To quantify the traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on 19 roadway segments surrounding the Project site were calculated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in *Covina Bowl Transportation and Parking Analysis*. (2) To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing, Future 2024 Cumulative, and Future 2040 General Plan conditions. The analysis shows that the unmitigated Project-related traffic noise level increases will be *less than significant*.

ON-SITE NOISE ANALYSIS

A noise impact analysis has been completed to determine the on-site traffic noise exposure levels for the noise sensitive multi-family residential component of the Project that would result from nearby transportation noise sources, and to identify potential noise mitigation measures that would achieve acceptable Project exterior and interior noise levels. The primary source of traffic noise affecting the Project site is anticipated to be from San Bernardino Road, Badillo Street and Rimsdale Avenue. No exterior noise mitigation is required to satisfy the City of Covina General Plan Noise Element exterior land use/noise level compatibility criteria for multi-family residential uses.

To satisfy the City of Covina interior noise level standards, the multi-family residential land use will require a windows-closed condition requiring a means of mechanical ventilation (e.g. air conditioning). Therefore, the future on-site interior traffic noise impacts will be *less than significant* with the following typical building construction measures:

- Windows: All residential units require first, second and third floor windows and sliding glass doors that have well-fitted, well-weather-stripped assemblies, with minimum sound transmission class (STC) ratings of 27.
- Doors (Non-Glass): All exterior doors shall be well weather-stripped and have minimum STC ratings of 25. Well-sealed perimeter gaps around the doors are essential to achieve the optimal STC rating. (3)

- Walls: At any penetrations of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar to form an airtight seal.
- Roof: Roof sheathing of wood construction shall be per manufacturer's specification or caulked plywood of at least one-half inch thick. Ceilings shall be per manufacturer's specification or well-sealed gypsum board of at least one-half inch thick. Insulation with at least a rating of R-19 shall be used in the attic space.
- Ventilation: Arrangements for any habitable room shall be such that any exterior door or window can be kept closed when the room is in use and still receive circulated air. A forced air circulation system (e.g. air conditioning) or active ventilation system (e.g. fresh air supply) shall be provided which satisfies the requirements of the Uniform Building Code.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected noise sources from the Covina Bowl site, this analysis estimates the Project-related stationary-source operational noise levels at receiver locations. The typical activities associated with the proposed Covina Bowl are anticipated to include roof-top air conditioning units, and parking lot vehicle movements. The operational noise analysis shows that Project activities will satisfy the City of Covina daytime and nighttime exterior noise level thresholds at all receiver locations.

Further, this analysis demonstrates that the Project operational noise levels will not contribute a long-term operational noise level impact to the existing ambient noise environment at any of the sensitive receiver locations. Therefore, the operational noise level impacts associated with the proposed 24-hour seven days per week Project activities, such as the roof-top air conditioning units, and parking lot vehicle movements, are considered *less than significant*.

CONSTRUCTION NOISE ANALYSIS

On-site construction noise represents a short-term increase on the ambient noise levels associated with the development of the Project on receivers. Construction-related noise impacts are expected to create temporary and intermittent high-level noise conditions at receivers surrounding the Project site when certain activities occur at the Project site boundary. Using sample reference noise levels to represent the planned construction activities of Covina Bowl site, this analysis estimates the Project-related construction noise levels at sensitive receiver locations. Since the City of Covina General Plan and Municipal Codes do not identify specific construction noise level limits, this analysis relies on the 85 dBA Leq threshold identified by the National Institute for Occupational Safety and Health (NIOSH) to quantify and determine potential construction noise level impacts.

This analysis shows that the Project-related short-term construction noise levels are estimated to range from 67.4 to 76.4 dBA L_{eq} and will satisfy the 85 dBA L_{eq} threshold identified by the National Institute for Occupational Safety and Health (NIOSH). (4) and therefore, the noise level impacts at the sensitive receiver locations are considered *less than significant*.

CONSTRUCTION NOISE ABATEMENT MEASURES

- Construction activities shall only occur between the hours of 7:00 a.m. to 8:00 p.m. daily, with no activity allowed on Sundays or holidays (City of Covina Municipal Code Section 9.40.110(A). In addition, due to the potential construction noise level impacts, application for a permit authorizing work is required per the City of Covina Municipal Code Section 9.40.110(B).
- 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 receivers 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 activities (i.e., to the center).

CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. At distances ranging from 12 to 201 feet from primary construction activities, construction vibration velocity levels are estimated at 0.1900 in/sec root-mean-square velocity (RMS), and will exceed City of Covina RMS vibration threshold of 0.01 in/sec at receiver locations R4 and R5. As such, the Project-related vibration impacts will be *potentially significant* during construction activities at the Project site. Therefore, a 90-foot buffer zone vibration mitigation measure is required which would restrict the use of large loaded trucks and dozers (greater than 80,000 pounds) and jack hammers within 90-feet of occupied sensitive receiver locations represented by R4 and R5. With the mitigation measures identified in this report, the mitigated vibration levels with the 90-foot buffer zone will be reduced to 0.0093 in/sec RMS, and will satisfy the City of Covina perceptible vibration threshold of 0.01 in/sec RMS. Therefore, impacts with the construction vibration mitigation measure identified in this study will be *less than significant*.

CONSTRUCTION VIBRATION MITIGATION

To reduce the construction vibration impacts to *less than significant* levels, the following vibration mitigation measure is required for Project-related construction activities:

- Large loaded trucks and dozers (greater than 80,000 pounds) and jack hammers shall not be used within 90 feet of occupied noise-sensitive residential homes, represented by receiver locations R4 and R5, during Project construction activities. Instead, small rubber-tired or alternative equipment shall be used within this area during Project construction to reduce vibration effects.

SUMMARY OF CEQA SIGNIFICANCE FINDINGS

The results of this Covina Bowl 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.

ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

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

1 INTRODUCTION

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

1.1 SITE LOCATION

The proposed Covina Bowl Project is located south of San Bernardino Road and west of Rimsdale Avenue in the City of Covina, as shown on Exhibit 1-A. The Project site includes the following parcels within the Covina Bowl Specific Plan.

- 1060 W. San Bernardino Road – Vacant; former bowling alley.
- 1103 W. Badillo Street – Vacant day care.
- 1111 W. Badillo Street – Existing Church

The Project site is located in a portion of City of Covina that is developed and developing, with commercial and retail uses to the north; multi-family and retail uses to the west; office and retail uses to the south; and single-family residential uses to the south.

1.2 PROJECT DESCRIPTION

The proposed project consists of a Specific Plan that would allow construction in Planning Areas 1 and 2 for up to 132 residential townhome units and the restoration of the original 1955 building for re-occupancy as a 12,000 square-foot office/coffee shop space, as shown on Exhibit 1-B. It is anticipated that the Project would be developed and occupied by the year 2024 for Planning Areas 1 and 2.

While no specific development is proposed at this time for Planning Areas 3 and 4, the maximum potential build-out of these areas within the Specific Plan are included as part of the General Plan build-out (Year 2040) condition. Planning Area 3 includes the removal of the existing office space for the potential development of an equivalent 4,175 square-foot retail space. Planning Area 4 includes the removal of the existing 31-unit apartment building and 4,652 square foot restaurant for the development of approximately 37,244 square feet of retail space. The on-site Project-related operational noise sources are expected to include: roof-top air conditioning units, and parking lot vehicle movements.

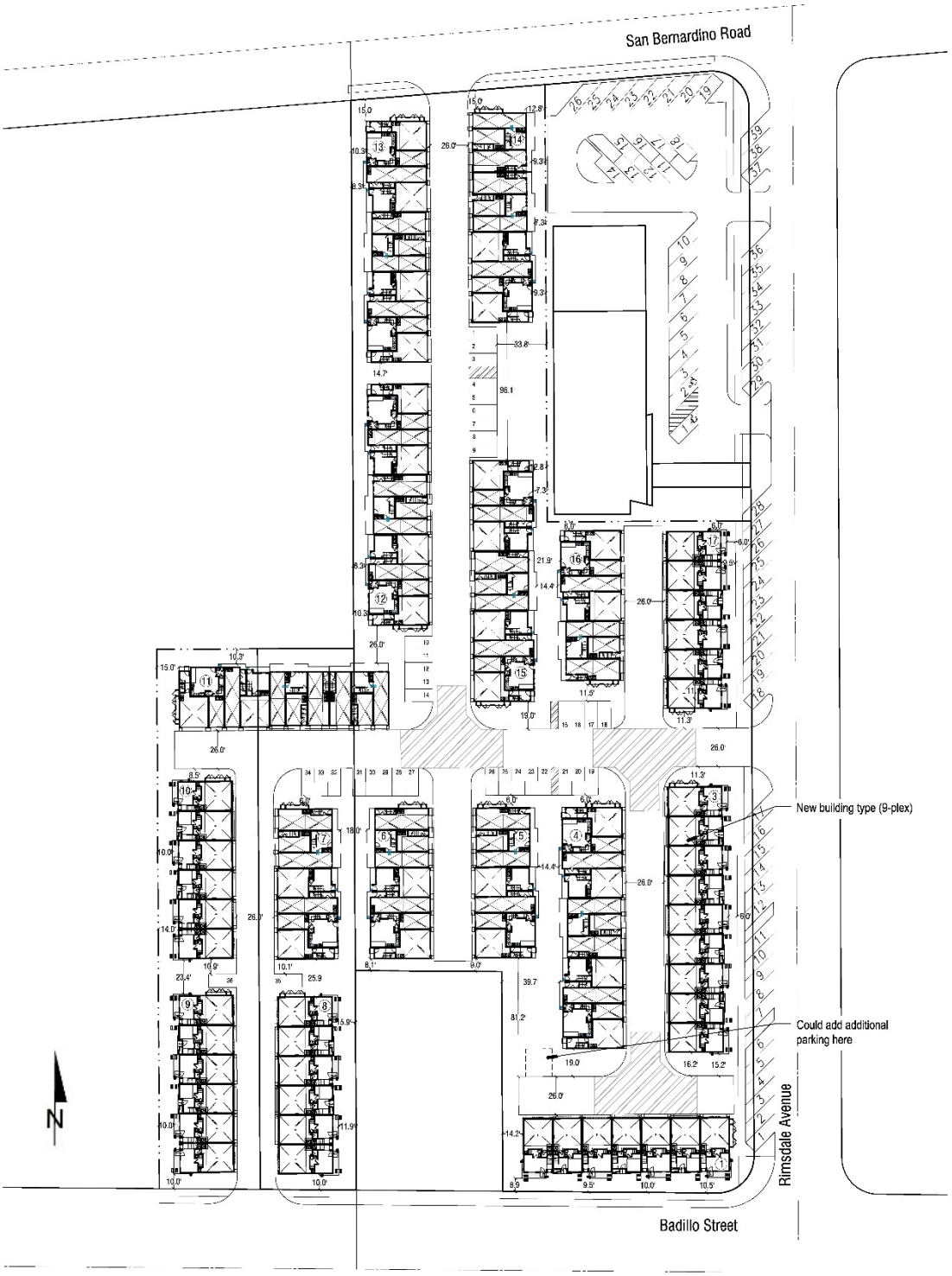
EXHIBIT 1-A: LOCATION MAP

LEGEND:

Development Site

Project Area

EXHIBIT 1-B: SITE PLAN



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2 FUNDAMENTALS

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

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (5) 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. (6) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most used 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 Covina 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. (5)

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. (7)

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. (5)

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. (7)

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. (7)

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. (8)

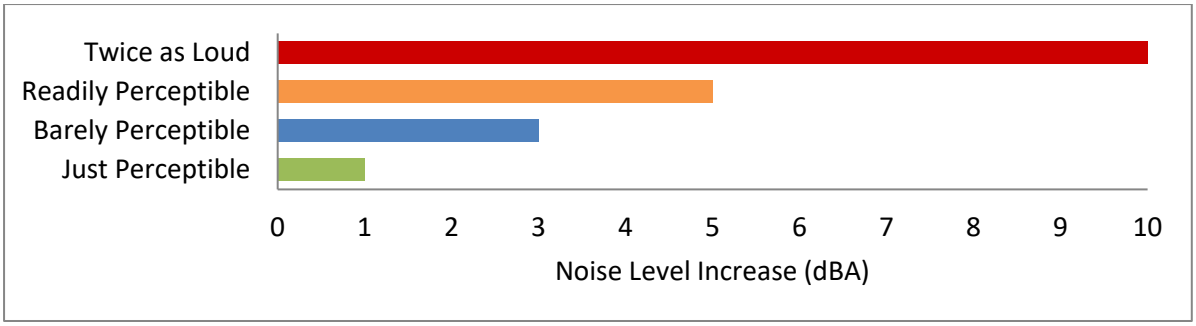
2.7 COMMUNITY RESPONSE TO NOISE

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. (9) 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. (9) 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 are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (7)

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. (10)

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.

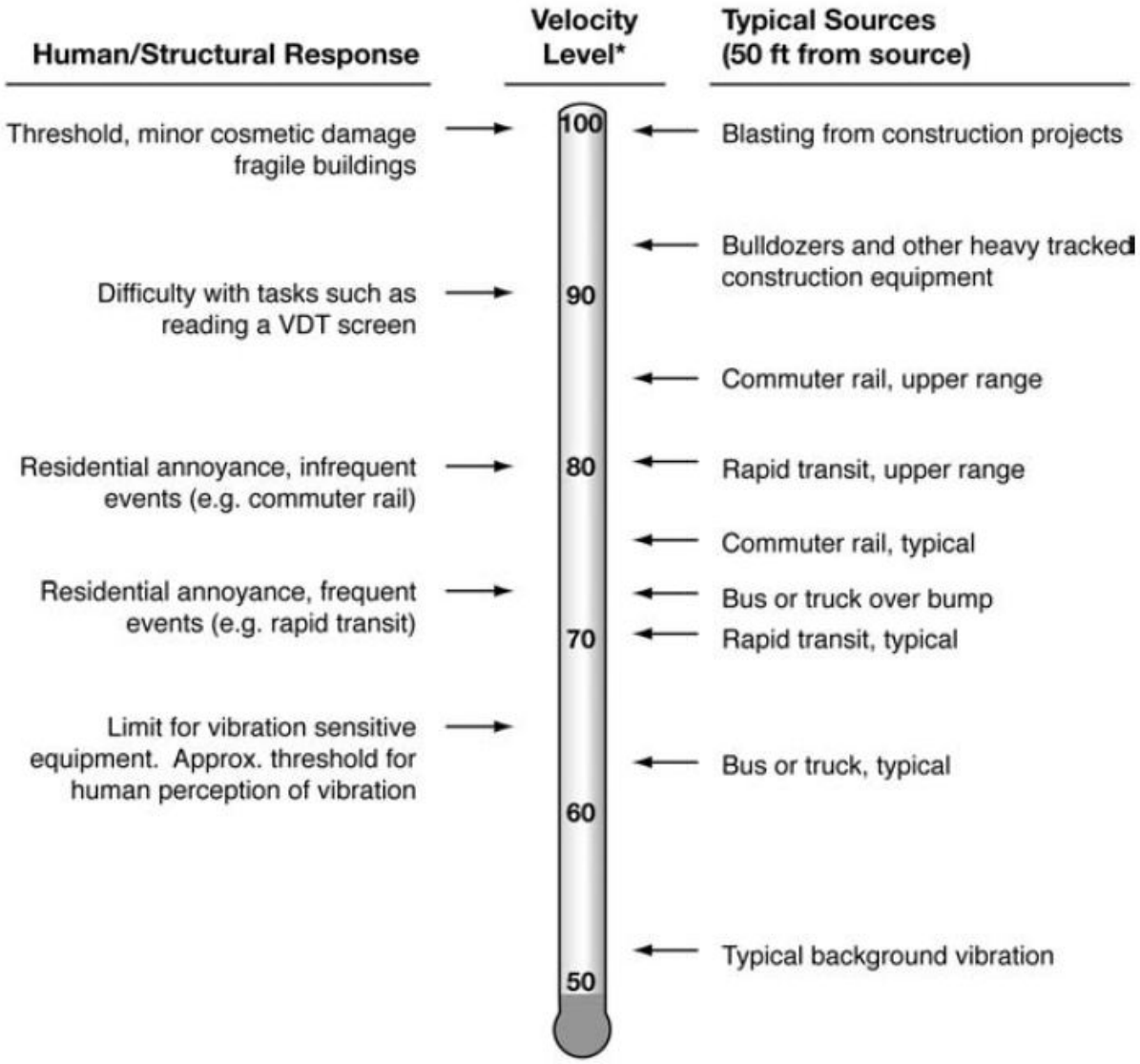
2.9 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (11), 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). (12) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 STATE OF CALIFORNIA BUILDING CODE

The State of California's noise insulation standards 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 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 COVINA NOISE ELEMENT

The City of Covina has adopted a Noise Element of the General with the goal of creating *an environment in which potential adverse impacts of noise on the City's residents and works are identified and prevented and mitigated.* (13) The Noise Element recognizes that *the City generally has limited regulatory control over the transportation noise sources…State and Federal agencies have the responsibility to control noises associated with these sources. Nevertheless, the City can deal with transportation sounds in various ways, such as by encouraging and administering*

proper, noise-reducing land use compatibility and site planning principles as well as, when appropriate, by working with transportation providers to resolve problems. To control transportation related noise sources, the City of Covina has adopted the following policies that apply to the Project:

C.1: Examine the noise environment of proposed residential or other noise-sensitive uses located within all 60 Ldn noise contours to ensure compatibility and, pertaining to residential activities, adherence to applicable State noise insulation standards.

C.2: Attempt to mitigate or eliminate the possible noise problems of proposed residential or other noise-sensitive uses located within all 65 Ldn noise contours to ensure compatibility and, pertaining to residential activities, adherence to applicable State noise insulation standards.

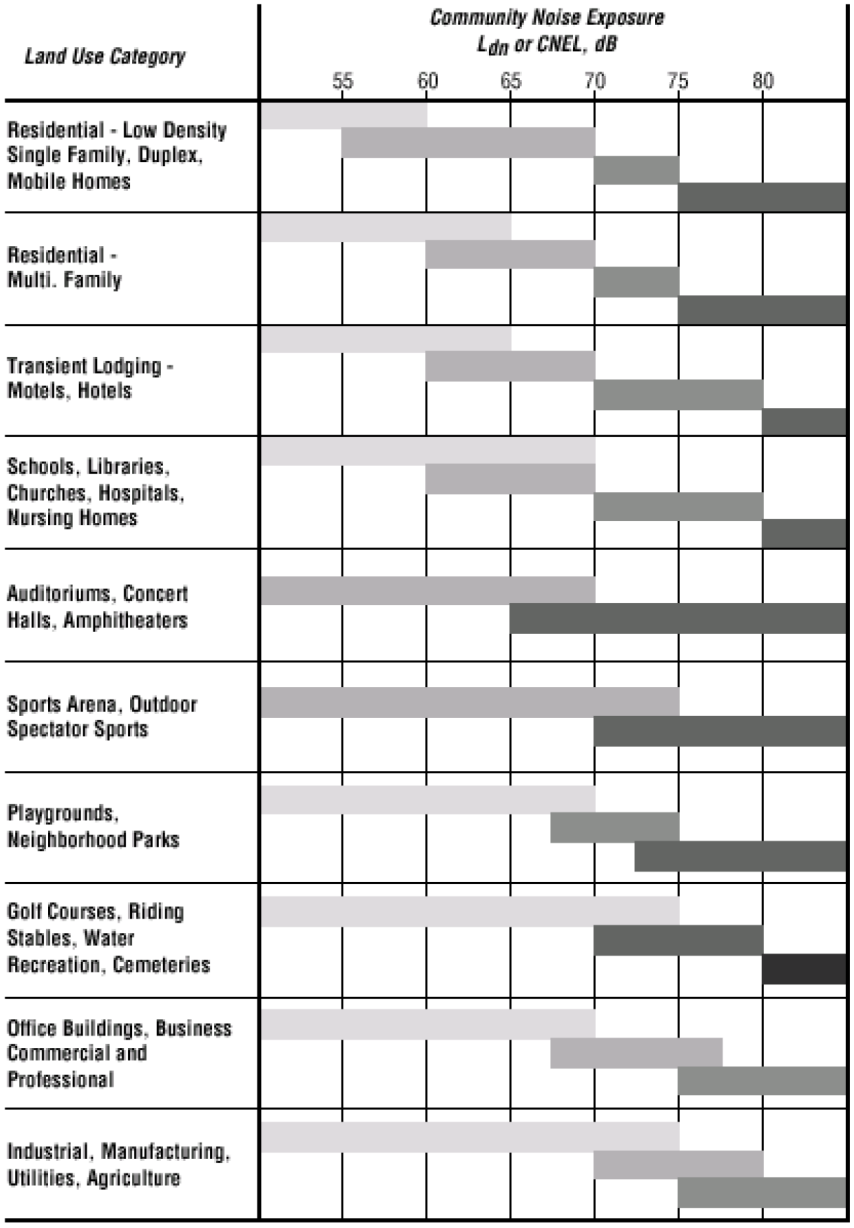
C.3: Consider "noise-sensitive uses" to include, but not be limited to, all residential housing types, public and private primary and secondary schools, libraries, parks/recreation areas, hospitals/medical facilities, nursing homes, and churches.

The Noise Element typically provides the standards for land use compatibility for community noise exposure. However, the City of Covina General Plan does not include specific transportation-related noise standards. While the General Plan provides background and noise fundamentals, it does not identify criteria to assess the impacts associated with transportation-related noise impacts. Therefore, for this analysis, the transportation noise criteria are derived from standards contained in the California Office of Planning and Research (OPR) *General Plan Guidelines*. (12)

The OPR land use/noise compatibility standards are used by many California cities and counties and specify the maximum noise levels allowable for new developments impacted by transportation noise sources. The OPR land use/noise compatibility criteria, found in Figure 2 of the *General Plan Guidelines, Appendix D: Noise Element Guidelines,* identify the criteria for multi-family residential land uses such as the Project, as shown on Exhibit 3-A. When the unmitigated exterior noise levels approach 65 dBA CNEL, multi-family residential land use is considered *normally acceptable*. With exterior noise levels ranging from 60 to 70 dBA CNEL, multi-family residential land uses land uses are considered *conditionally acceptable*, and with exterior noise levels greater than 70 dBA CNEL, they are considered *normally unacceptable*. For *normally unacceptable* land use, *new construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.* (12)

For the purposes of this analysis, multi-family residential land use such as the Project does not contain outdoor living areas requiring exterior noise mitigation as outlined in the OPR *General Plan Guidelines*, and therefore, only the interior noise levels at the Project site are evaluated against the 45 dBA CNEL California Building Code and the City of Covina interior noise standards.

EXHIBIT 3-A: LAND USE NOISE COMPATIBILITY CRITERIA



INTERPRETATION:

Normally Acceptable
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

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

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

Source: OPR General Plan Guidelines, Appendix D: Noise Element Guidelines, Figure 2.

3.4 INTERIOR NOISE LEVEL STANDARDS

Section 9.40.060(F) of The City of Covina Municipal Code indicates that all newly constructed residential dwellings located in areas that are exposed to ambient noise levels in excess of 60 dBA Ldn shall be designed and built so that all habitable rooms comply the base interior noise level standards of 45 dBA L_{eq} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 35 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.) as outlined in Section 9.40.060(A). (14) Table 3-1 presents a summary of interior noise level standards for all noise sensitive residential land use. The City of Covina Municipal Code noise standards are provided in Appendix 3.1.

TABLE 3-1: RESIDENTIAL INTERIOR NOISE STANDARDS

City	Source Land use	Interior Noise Level Standards (dBA Leq)[1]	
		Daytime	Nighttime
Covina	Residential[2]	45	35

[1] City of Covina Municipal Code, Section 9.40.060 Interior noise level limits (Appendix 3.1). Leq represents a steady state sound level containing the same total energy as a time varying signal over a given period. "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.
[2] All residential land use.

3.5 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Covina Bowl Project, stationary-source (operational) noise such as the expected roof-top air conditioning units, and parking lot vehicle movements are typically evaluated against standards established under a jurisdiction's Municipal Code. The City of Covina Municipal Code, Chapter 9.40 establishes the noise level standards for stationary noise sources. The Project's residential and office/coffee shop land uses will potentially impact nearby noise-sensitive uses in the Project study area. As shown on Table 3-2, for noise-sensitive medium and high density residential land uses in the Project study area, Section 9.40.040 identifies the base exterior noise level standard of 60 dBA L_{eq} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.). (14)

TABLE 3-2: OPERATIONAL EXTERIOR NOISE STANDARDS

City	Source Land use	Exterior Noise Level Standards (dBA Leq)[1]	
		Daytime	Nighttime
Covina	Residential[2]	60	50
	Commercial	65	55

[1] City of Covina Municipal Code, Section 9.40.040 Exterior noise level limits (Appendix 3.1). Leq represents a steady state sound level containing the same total energy as a time varying signal over a given period. "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.
[2] Medium and high density residential consistent with the existing residential land uses adjacent to the Project site.

3.6 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Covina Bowl Project, noise from construction activities are typically limited to the hours of operation established under a jurisdiction's Municipal Code. Section 9.40.110(A) the City of Covina Municipal Code, provided in Appendix 3.1, indicates *that It is unlawful for any person within any residential land use category or within a radius of 500 feet therefrom to operate equipment or perform any outside construction or repair work on any building, structure, or project; or to operate any pile driver, steam shovel, pneumatic hammer, electric saw, grinder, steam or electric hoist, or other construction-type equipment or device between the hours of 8:00 p.m. of any one day and 7:00 a.m. of the next day, at any time on any Sunday or at any time on any public holiday in such a manner that a reasonable person of normal sensitivity residing in the area is caused discomfort or annoyance, unless beforehand a permit therefor has been duly obtained in accordance with the provisions of subsection (B) of this section.*

9.40.110(B). *A permit may be issued authorizing the work prohibited by this section whenever it is found that the public interest will be served thereby. An application for such a permit shall be in writing and shall be accompanied by an application fee in an amount that may be set from time to time by a resolution of the city council. The application shall set forth in detail facts showing that the public interest will be served by the issuance of such permit, and the application shall be made to the planning division of the community development department. The chief planning official shall be responsible for the administration and enforcement of the provisions of this section and shall have the authority to issue such permits. He/she shall coordinate the processing of each application for a permit with such departments and divisions as he/she deems will be affected by the issuance of the permit.*

Neither the City of Covina General Plan and Municipal Codes establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*. To evaluate whether the Project will generate potentially significant construction noise levels at sensitive receiver locations, a construction-related noise level threshold is adopted from the *Criteria for Recommended Standard: Occupational Noise Exposure* prepared by the National Institute for Occupational Safety and Health (NIOSH). (4) A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source.

The construction related noise level threshold starts at 85 dBA for more than eight hours per day, and for every 3 dBA increase, the exposure time is cut in half. This results in noise level thresholds of 88 dBA for more than four hours per day, 92 dBA for more than one hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. (4) For the purposes of this analysis, the lowest, more conservative construction noise level threshold of 85 dBA L_{eq} is used as an acceptable threshold for construction noise at the sensitive receiver locations. Since this construction-related noise level threshold represents the energy average of the noise source over a given time, they are expressed as L_{eq} noise levels. Therefore, the noise level threshold of 85 dBA L_{eq} over a period of eight hours or more is used to evaluate the potential

Project-related construction noise level impacts at the sensitive receiver locations. The NIOSH 85 dBA L_{eq} construction noise level threshold used in the Noise Study is consistent with similar construction noise level thresholds identified by the Federal Transit Administration (FTA) that are specific to noise-sensitive residential uses. The FTA Transit Noise and Vibration Impact Assessment identifies a daytime construction noise level threshold of 90 dBA L_{eq} for general assessment. (11) As such, the NIOSH 85 dBA L_{eq} threshold used in the Noise Study to identify potential impacts is more conservative than the FTA threshold which is specific to construction noise at residential receiver locations.

Consistent with the NIOSH 85 dBA L_{eq} construction noise level threshold, the Occupational Safety and Health Administration (OSHA) requires employers to implement a hearing conservation program when noise exposure is at or above 85 dBA over 8 working hours. (4) Workers are required to wear hearing protection when engaged in work that exposes them to noise that equals or exceeds 85 dBA over 8 working hours. This analysis does not evaluate the noise exposure of construction workers within the Project site based on CEQA requirements, and instead, evaluates the Project-related construction noise levels at the sensitive receiver locations using a construction noise level threshold that is consistent with guidelines and standards identified by NIOSH, FTA and OSHA.

3.7 CONSTRUCTION VIBRATION STANDARDS

The City of Covina Municipal Code, Section 9.40.020(30), defines the vibration perception threshold as 0.01 inches per second (in/sec) RMS. As such, this noise study uses the City of Covina Municipal Code vibration perception threshold of 0.01 in/sec RMS to assess the potential vibration impacts due to Project construction.

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 Covina General Plan 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 are considered substantial for use under Guideline A. CEQA Appendix G Guideline C applies to nearby public and private airports, if any, and the Project's land use compatibility.

4.1 CEQA GUIDELINES NOT FURTHER ANALYZED

The Project site is not located within two miles of a public airport or within an airport land use plan. The closest airport is the Los Angeles/Ontario International Airport located over 17 miles east of the Project site. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Guideline C.

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.* (15)

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (16) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON

recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2020 California Court of Appeal ruling in *King and Gardiner Farms, LLC v. County of Kern*. (15) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the existing noise levels are below 60 dBA. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance.

The FICON guidance provides an established source of criteria to assess the impacts of substantial temporary or permanent increase in ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance are consistent with guidance provided by both the Federal Highway Administration (7 p. 9) and Caltrans (17 p. 2_48).

4.3 NON-NOISE-SENSITIVE RECEIVERS

As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise level for non-noise-sensitive land use, such as industrial use, is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* according to the *Land Use Compatibility for Community Noise Environments*. (12) To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria are used. When the without Project noise levels at the non-noise-sensitive land uses are below the *normally acceptable* 70 dBA CNEL compatibility criteria, a *readily perceptible* 5 dBA or greater noise level increase is considered a significant impact. When the without Project noise levels are greater than the *normally acceptable* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts

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 4-1 shows the significance criteria summary matrix.

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
  - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
  - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase; or
  - already exceed 65 dBA CNEL, and the Project creates a community noise level increase of greater than 1.5 dBA CNEL (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g., office, commercial, industrial):
  - are less than the OPR General Plan Guidelines, Figure 2, *normally acceptable* 70 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
  - are greater than the OPR General Plan Guidelines, Figure 2, *normally acceptable* 70 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase.

ON-SITE TRAFFIC NOISE

- If the on-site noise levels:
  - exceed an interior noise level of 45 dBA L_{eq} daytime or 35 dBA L_{eq} nighttime noise level standards at all residential land use densities. (City of Covina Municipal Code Section 9.40.060)
  - exceed an interior noise level of 45 dBA CNEL for residential uses (California Building Code).

OPERATIONAL NOISE

- If Project-related operational (stationary source) noise levels:
  - exceed the exterior 60 dBA L_{eq} daytime or 50 dBA L_{eq} nighttime noise level standards at nearby sensitive residential receiver locations (City of Covina Municipal Code, Section 9.40.040).
  - exceed the exterior 65 dBA L_{eq} daytime or 55 dBA L_{eq} nighttime noise level standards at nearby commercial receiver locations (City of Covina Municipal Code, Section 9.40.040).
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
  - are less than 60 dBA L_{eq} and the Project creates a *readily perceptible* 5 dBA L_{eq} or greater Project-related noise level increase; or
  - range from 60 to 65 dBA L_{eq} and the Project creates a *barely perceptible* 3 dBA L_{eq} or greater Project-related noise level increase; or

- already exceed 65 dBA L_{eq}, and the Project creates a community noise level increase of greater than 1.5 dBA L_{eq} (FICON, 1992).

CONSTRUCTION NOISE & VIBRATION

- If Project-related construction activities occur at any time other than the permitted hours of 7:00 a.m. to 8:00 p.m. on any day except Sunday or a City-recognized holiday (City of Covina Municipal Code, Section 9.40.110(A))
- If Project-related construction activities create noise levels which exceed the 85 dBA Leq acceptable noise level threshold at the nearby sensitive receiver locations (NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure);
- If Project generated operational vibration levels exceed the City of Covina Municipal Code Section 9.40.020(30) vibration perception threshold of 0.01 in/sec RMS.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site Traffic	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	Residential	Interior Noise Level Standard	45 dBA L_{eq}[3]	35 dBA L_{eq}[3]
			45 dBA CNEL[4]	
Operational	Noise-Sensitive[1]	Exterior Noise Level Standard	See Table 3-2	
		if ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA L_{eq} Project increase	
		if ambient is 60 - 65 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase	
		if ambient is > 65 dBA L_{eq}[1]	≥ 1.5 dBA L_{eq} Project increase	
Construction	Noise-Sensitive[1]	Permitted hours of 7:00 a.m. to 8:00 p.m. on any day except Sunday or a public holiday[5]		
		Exterior Noise Level Threshold[6]	85 dBA L_{eq}	
		Vibration Level Threshold[7]	0.01 in/sec RMS	n/a

[1] FICON, 1992.
[2] OPR General Plan Guidelines, Figure 2 Land Use Compatibility Criteria.
[3] City of Covina Municipal Code, Section 9.40.060 Interior noise level limits (Appendix 3.1).
[4] California Building Code.
[5] City of Covina Municipal Code, Section 9.40.110(A)(Appendix 3.1).
[6] Acceptable threshold for construction noise based on the Criteria for Recommended Standard: Occupational Noise Exposure prepared by the National Institute for Occupational Safety and Health.
[7] City of Covina Municipal Code, Section 9.40.020(30)(Appendix 3.1).
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at five 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, May 6th, 2020. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (18)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (5) 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*. (11)

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. (7) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels

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

5.3 NOISE MEASUREMENT RESULTS

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

- Location L1 represents the noise levels north of the Project site on West San Bernardino Road near existing single-family home at 1123 West San Bernardino Road. The noise level measurements collected show an overall 24-hour exterior noise level of 71.3 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 68.6 dBA L_{eq} with an average nighttime noise level of 63.1 dBA L_{eq}.
- Location L2 represents the noise levels east of the Project site in the parking lot of Home Depot. The noise level measurements collected show an overall 24-hour exterior noise level of 59.2 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 55.0 dBA L_{eq} with an average nighttime noise level of 52.0 dBA L_{eq}.
- Location L3 represents the noise levels south of the Project site on West Badillo Street near existing single-family residential home at 1108 Badillo Street. The noise level measurements collected show an overall 24-hour exterior noise level of 69.1 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 65.2 dBA L_{eq} with an average nighttime noise level of 61.6 dBA L_{eq}.
- Location L4 represents the noise levels by the western boundary of the Project site near the existing single-family residential home at 1119 West Badillo Street. The noise level measurements collected show an overall 24-hour exterior noise level of 60.6 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 59.5 dBA L_{eq} with an average nighttime noise level of 51.7 dBA L_{eq}.
- Location L5 represents the noise levels northwest of the Project site by the Covina Bonita Apartments at 1130 West San Bernardino Road. The 24-hour CNEL indicates that the overall exterior noise level is 58.0 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 52.4 dBA L_{eq} with an average nighttime noise level of 51.1 dBA L_{eq}.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods. The background ambient noise levels in the Project study area are dominated by surface streets. The 24-hour existing noise level measurement results are shown on Table 5-1.

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

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL
		Daytime	Nighttime	
L1	Located north of the Project site on West San Bernardino Road near existing single-family home at 1123 West San Bernardino Road.	68.6	63.1	71.3
L2	Located east of the Project site in the parking lot of Home Depot.	55.0	52.0	59.2
L3	Located south of the Project site on West Badillo Street near existing single-family residential home at 1108 Badillo Street.	65.2	61.6	69.1
L4	Located by the western boundary of the Project site near the existing single-family residential home at 1119 West Badillo Street.	59.5	51.7	60.6
L5	Located northwest of the Project site by the Covina Bonita Apartments at 1130 West San Bernardino Road.	52.4	51.1	58.0

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

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

6 METHODS AND PROCEDURES

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

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The estimated roadway noise impacts from vehicular traffic were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (19) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (20) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period.

6.1.1 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the 19 study area roadway segments, the distance from the centerline to adjacent land use based on the roadway facility type, and the posted vehicle speeds. For this analysis, soft site conditions are used to analyze the off-site traffic noise impacts within the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. Caltrans' research has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model as used in this off-site traffic noise analysis. (21)

The Existing, Future 2024 Cumulative, and Future 2040 General Plan average daily traffic volumes derived from the peak hour turning movements used for this study are presented on Table 6-2 and are provided by *Covina Bowl Transportation and Parking Analysis*. (2) Table 6-3 presents the time of day vehicle splits and Table 6-4 presents the traffic flow distributions (vehicle mix) used for this analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks, and heavy trucks for input into the FHWA noise prediction model.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Land Use[1]	Classification[1]	Centerline Distance to Receiving Land Use (Feet)[2]	Vehicle Speed (mph)
1	Lark Ellen Av.	n/o Cypress St.	Sensitive	Collector	40'	40
2	Lark Ellen Av.	s/o Cypress St.	Sensitive	Collector	40'	40
3	Lark Ellen Av.	s/o San Bernardino Rd.	Sensitive	Collector	40'	40
4	Lark Ellen Av.	n/o Puente Av.	Sensitive	Collector	40'	40
5	Rimsdale Av.	s/o San Bernardino Rd.	Non-Sensitive	Collector	40'	40
6	Azusa Av.	n/o Cypress St.	Non-Sensitive	Primary Arterial	50'	40
7	Azusa Av.	n/o San Bernardino Rd.	Non-Sensitive	Primary Arterial	50'	40
8	Azusa Av.	s/o Badillo St	Sensitive	Primary Arterial	50'	40
9	Azusa Av.	s/o Puente Av.	Sensitive	Primary Arterial	50'	40
10	Hollenbeck Av.	n/o San Bernardino Rd.	Sensitive	Secondary Arterial	40'	35
11	Hollenbeck Av.	s/o Badillo St	Sensitive	Secondary Arterial	40'	35
12	San Bernardino Rd.	w/o Lark Ellen Av.	Sensitive	Secondary Arterial	40'	40
13	San Bernardino Rd.	e/o Rimsdale Av.	Non-Sensitive	Secondary Arterial	40'	35
14	San Bernardino Rd.	e/o Hollenbeck Av.	Sensitive	Secondary Arterial	40'	30
15	Badillo St.	w/o Lark Ellen Av.	Sensitive	Primary Arterial	50'	45
16	Badillo St.	w/o Azusa Av.	Sensitive	Primary Arterial	50'	40
17	Badillo St.	e/o Armel Dr.	Sensitive	Primary Arterial	50'	40
18	Puente Av.	w/o Lark Ellen Av.	Sensitive	Primary Arterial	50'	40
19	Puente Av.	e/o Azusa Av.	Sensitive	Collector	40'	35

[1] Sources: Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] Based upon the right-of-way distances for each roadway classification provided in the General Plan Circulation Element.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]					
			Existing		Future 2024 Cumulative		Future 2040 General Plan	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Lark Ellen Av.	n/o Cypress St.	13,320	13,450	14,050	14,180	15,200	15,450
2	Lark Ellen Av.	s/o Cypress St.	11,600	11,660	12,310	12,370	13,310	13,420
3	Lark Ellen Av.	s/o San Bernardino Rd.	14,540	14,670	15,330	15,460	16,600	16,860
4	Lark Ellen Av.	n/o Puente Av.	17,580	17,640	18,590	18,650	20,130	20,240
5	Rimsdale Av.	s/o San Bernardino Rd.	2,310	2,310	2,430	2,430	2,620	2,620
6	Azusa Av.	n/o Cypress St.	18,850	19,010	20,030	20,190	21,670	21,980
7	Azusa Av.	n/o San Bernardino Rd.	18,410	18,410	19,710	19,710	21,320	21,460
8	Azusa Av.	s/o Badillo St	20,180	20,180	21,560	21,560	23,320	23,460
9	Azusa Av.	s/o Puente Av.	23,220	23,380	24,800	24,960	26,830	27,150
10	Hollenbeck Av.	n/o San Bernardino Rd.	11,930	11,930	12,820	12,820	13,860	13,860
11	Hollenbeck Av.	s/o Badillo St	10,820	10,820	11,650	11,650	12,590	12,600
12	San Bernardino Rd.	w/o Lark Ellen Av.	15,160	15,440	16,500	16,780	17,820	18,480
13	San Bernardino Rd.	e/o Rimsdale Av.	15,610	15,700	16,940	17,030	18,300	18,900
14	San Bernardino Rd.	e/o Hollenbeck Av.	11,700	11,830	12,980	13,110	14,000	14,240
15	Badillo St.	w/o Lark Ellen Av.	16,380	16,520	17,360	17,500	18,780	18,960
16	Badillo St.	w/o Azusa Av.	17,410	17,540	18,460	18,590	19,980	20,240
17	Badillo St.	e/o Armel Dr.	16,560	16,690	17,400	17,530	19,000	19,260
18	Puente Av.	w/o Lark Ellen Av.	10,450	10,450	11,190	11,190	12,100	12,110
19	Puente Av.	e/o Azusa Av.	11,580	11,580	12,360	12,360	13,370	13,390

[1] Source: Covina Bowl Specific Plan Project - Transportation and Parking Study Scope of Work, Linscott, Law & Greenspan, Engineers.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	77.50%	12.90%	9.60%	100.00%
Medium Trucks	84.80%	4.90%	10.30%	100.00%
Heavy Trucks	86.50%	2.70%	10.80%	100.00%

[1] Source: 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)

Classification	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Roadways	97.42%	1.84%	0.74%	100.00%

6.1.2 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. Future traffic volumes on San Bernardino Road, Badillo Street and Rimsdale Avenue are based on *Covina Bowl Transportation and Parking Study* Future 2024 Cumulative with Project volumes. (2) As previously described, Table 6-3 presents the time of day vehicle splits and Table 6-4 presents the traffic flow distributions (vehicle mix) used for this analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks, and heavy trucks for input into the FHWA noise prediction model.

TABLE 6-5: ON-SITE ROADWAY PARAMETERS

Roadway	Lanes	Facility Type[1]	Future ADT Volume[2]	Posted Speed Limits (mph)	Site Conditions
San Bernardino Rd.	4	Collector	17,030	35	Soft
Badillo St.	4	Secondary Arterial	18,590	40	Soft
Rimsdale Av.	2	Local	2,430	25	Soft

[1] Based on the City of Covina General Plan Map
[2] Derived from the Future Year 2024 with Project Average Daily Traffic volumes from Covina Bowl Transportation and Parking Study.

6.2 CONSTRUCTION VIBRATION ASSESSMENT METHODOLOGY

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

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-6. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential Project construction vibration levels using the following vibration assessment methods defined by the FTA. The FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 6-6: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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

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

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7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the *Covina Bowl Transportation and Parking Analysis*. (2) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental 24-hour dBA CNEL 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 CNEL noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area.

Tables 7-1 through 7-6 present a summary of the exterior dBA CNEL traffic noise levels without barrier attenuation. Roadway segments are analyzed from the without Project to the with Project conditions in each of the following timeframes: Existing, Future 2024 Cumulative conditions, and Future 2040 General Plan conditions. Appendix 7.1 includes a summary of the dBA CNEL traffic noise level contours for each of the traffic scenarios.

TABLE 7-1: EXISTING 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	Lark Ellen Av.	n/o Cypress St.	Sensitive	68.6	RW	69	149
2	Lark Ellen Av.	s/o Cypress St.	Sensitive	68.0	RW	63	136
3	Lark Ellen Av.	s/o San Bernardino Rd.	Sensitive	69.0	RW	74	158
4	Lark Ellen Av.	n/o Puente Av.	Sensitive	69.8	RW	83	180
5	Rimsdale Av.	s/o San Bernardino Rd.	Non-Sensitive	61.0	RW	RW	46
6	Azusa Av.	n/o Cypress St.	Non-Sensitive	68.4	RW	84	181
7	Azusa Av.	n/o San Bernardino Rd.	Non-Sensitive	68.3	RW	83	178
8	Azusa Av.	s/o Badillo St	Sensitive	68.7	RW	88	189
9	Azusa Av.	s/o Puente Av.	Sensitive	69.3	RW	96	208
10	Hollenbeck Av.	n/o San Bernardino Rd.	Sensitive	66.7	RW	52	112
11	Hollenbeck Av.	s/o Badillo St	Sensitive	66.3	RW	49	105
12	San Bernardino Rd.	w/o Lark Ellen Av.	Sensitive	69.1	RW	76	163
13	San Bernardino Rd.	e/o Rimsdale Av.	Non-Sensitive	67.9	RW	62	134
14	San Bernardino Rd.	e/o Hollenbeck Av.	Sensitive	65.0	RW	40	86
15	Badillo St.	w/o Lark Ellen Av.	Sensitive	69.0	RW	93	200
16	Badillo St.	w/o Azusa Av.	Sensitive	68.0	RW	80	172
17	Badillo St.	e/o Armel Dr.	Sensitive	67.8	RW	77	166
18	Puente Av.	w/o Lark Ellen Av.	Sensitive	65.8	RW	57	122
19	Puente Av.	e/o Azusa Av.	Sensitive	66.6	RW	51	109

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

TABLE 7-2: EXISTING 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	Lark Ellen Av.	n/o Cypress St.	Sensitive	68.6	RW	70	150
2	Lark Ellen Av.	s/o Cypress St.	Sensitive	68.0	RW	63	137
3	Lark Ellen Av.	s/o San Bernardino Rd.	Sensitive	69.0	RW	74	159
4	Lark Ellen Av.	n/o Puente Av.	Sensitive	69.8	RW	84	180
5	Rimsdale Av.	s/o San Bernardino Rd.	Non-Sensitive	61.0	RW	RW	46
6	Azusa Av.	n/o Cypress St.	Non-Sensitive	68.4	RW	84	182
7	Azusa Av.	n/o San Bernardino Rd.	Non-Sensitive	68.3	RW	83	178
8	Azusa Av.	s/o Badillo St	Sensitive	68.7	RW	88	189
9	Azusa Av.	s/o Puente Av.	Sensitive	69.3	RW	97	209
10	Hollenbeck Av.	n/o San Bernardino Rd.	Sensitive	66.7	RW	52	112
11	Hollenbeck Av.	s/o Badillo St	Sensitive	66.3	RW	49	105
12	San Bernardino Rd.	w/o Lark Ellen Av.	Sensitive	69.2	RW	77	165
13	San Bernardino Rd.	e/o Rimsdale Av.	Non-Sensitive	67.9	RW	62	134
14	San Bernardino Rd.	e/o Hollenbeck Av.	Sensitive	65.0	RW	40	87
15	Badillo St.	w/o Lark Ellen Av.	Sensitive	69.1	RW	93	201
16	Badillo St.	w/o Azusa Av.	Sensitive	68.1	RW	80	172
17	Badillo St.	e/o Armel Dr.	Sensitive	67.8	RW	77	167
18	Puente Av.	w/o Lark Ellen Av.	Sensitive	65.8	RW	57	122
19	Puente Av.	e/o Azusa Av.	Sensitive	66.6	RW	51	109

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

TABLE 7-3: FUTURE 2024 CUMULATIVE 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	Lark Ellen Av.	n/o Cypress St.	Sensitive	68.8	RW	72	155
2	Lark Ellen Av.	s/o Cypress St.	Sensitive	68.2	RW	66	142
3	Lark Ellen Av.	s/o San Bernardino Rd.	Sensitive	69.2	RW	76	164
4	Lark Ellen Av.	n/o Puente Av.	Sensitive	70.0	40	87	187
5	Rimsdale Av.	s/o San Bernardino Rd.	Non-Sensitive	61.2	RW	RW	48
6	Azusa Av.	n/o Cypress St.	Non-Sensitive	68.6	RW	87	188
7	Azusa Av.	n/o San Bernardino Rd.	Non-Sensitive	68.6	RW	86	186
8	Azusa Av.	s/o Badillo St	Sensitive	69.0	RW	92	198
9	Azusa Av.	s/o Puente Av.	Sensitive	69.6	RW	101	217
10	Hollenbeck Av.	n/o San Bernardino Rd.	Sensitive	67.0	RW	54	117
11	Hollenbeck Av.	s/o Badillo St	Sensitive	66.6	RW	51	110
12	San Bernardino Rd.	w/o Lark Ellen Av.	Sensitive	69.5	RW	80	172
13	San Bernardino Rd.	e/o Rimsdale Av.	Non-Sensitive	68.2	RW	65	141
14	San Bernardino Rd.	e/o Hollenbeck Av.	Sensitive	65.4	RW	43	92
15	Badillo St.	w/o Lark Ellen Av.	Sensitive	69.3	RW	97	208
16	Badillo St.	w/o Azusa Av.	Sensitive	68.3	RW	83	178
17	Badillo St.	e/o Armel Dr.	Sensitive	68.0	RW	80	171
18	Puente Av.	w/o Lark Ellen Av.	Sensitive	66.1	RW	59	128
19	Puente Av.	e/o Azusa Av.	Sensitive	66.8	RW	53	114

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

TABLE 7-4: FUTURE 2024 CUMULATIVE 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	Lark Ellen Av.	n/o Cypress St.	Sensitive	68.9	RW	72	156
2	Lark Ellen Av.	s/o Cypress St.	Sensitive	68.3	RW	66	142
3	Lark Ellen Av.	s/o San Bernardino Rd.	Sensitive	69.2	RW	77	165
4	Lark Ellen Av.	n/o Puente Av.	Sensitive	70.0	40	87	187
5	Rimsdale Av.	s/o San Bernardino Rd.	Non-Sensitive	61.2	RW	RW	48
6	Azusa Av.	n/o Cypress St.	Non-Sensitive	68.7	RW	88	189
7	Azusa Av.	n/o San Bernardino Rd.	Non-Sensitive	68.6	RW	86	186
8	Azusa Av.	s/o Badillo St	Sensitive	69.0	RW	92	198
9	Azusa Av.	s/o Puente Av.	Sensitive	69.6	RW	101	218
10	Hollenbeck Av.	n/o San Bernardino Rd.	Sensitive	67.0	RW	54	117
11	Hollenbeck Av.	s/o Badillo St	Sensitive	66.6	RW	51	110
12	San Bernardino Rd.	w/o Lark Ellen Av.	Sensitive	69.6	RW	81	174
13	San Bernardino Rd.	e/o Rimsdale Av.	Non-Sensitive	68.2	RW	66	142
14	San Bernardino Rd.	e/o Hollenbeck Av.	Sensitive	65.5	RW	43	93
15	Badillo St.	w/o Lark Ellen Av.	Sensitive	69.3	RW	97	209
16	Badillo St.	w/o Azusa Av.	Sensitive	68.3	RW	83	179
17	Badillo St.	e/o Armel Dr.	Sensitive	68.1	RW	80	172
18	Puente Av.	w/o Lark Ellen Av.	Sensitive	66.1	RW	59	128
19	Puente Av.	e/o Azusa Av.	Sensitive	66.8	RW	53	114

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

TABLE 7-5: FUTURE 2040 GENERAL PLAN 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	Lark Ellen Av.	n/o Cypress St.	Sensitive	69.2	RW	76	163
2	Lark Ellen Av.	s/o Cypress St.	Sensitive	68.6	RW	69	149
3	Lark Ellen Av.	s/o San Bernardino Rd.	Sensitive	69.5	RW	80	173
4	Lark Ellen Av.	n/o Puente Av.	Sensitive	70.4	42	91	197
5	Rimsdale Av.	s/o San Bernardino Rd.	Non-Sensitive	61.5	RW	RW	51
6	Azusa Av.	n/o Cypress St.	Non-Sensitive	69.0	RW	92	198
7	Azusa Av.	n/o San Bernardino Rd.	Non-Sensitive	68.9	RW	91	196
8	Azusa Av.	s/o Badillo St	Sensitive	69.3	RW	97	208
9	Azusa Av.	s/o Puente Av.	Sensitive	69.9	RW	106	229
10	Hollenbeck Av.	n/o San Bernardino Rd.	Sensitive	67.3	RW	57	123
11	Hollenbeck Av.	s/o Badillo St	Sensitive	66.9	RW	54	116
12	San Bernardino Rd.	w/o Lark Ellen Av.	Sensitive	69.9	RW	84	181
13	San Bernardino Rd.	e/o Rimsdale Av.	Non-Sensitive	68.5	RW	69	149
14	San Bernardino Rd.	e/o Hollenbeck Av.	Sensitive	65.8	RW	45	97
15	Badillo St.	w/o Lark Ellen Av.	Sensitive	69.6	RW	102	219
16	Badillo St.	w/o Azusa Av.	Sensitive	68.6	RW	87	188
17	Badillo St.	e/o Armel Dr.	Sensitive	68.4	RW	84	182
18	Puente Av.	w/o Lark Ellen Av.	Sensitive	66.5	RW	62	135
19	Puente Av.	e/o Azusa Av.	Sensitive	67.2	RW	56	120

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

TABLE 7-6: FUTURE 2040 GENERAL PLAN WITH SPECIFIC PLAN BUILDOUT 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	Lark Ellen Av.	n/o Cypress St.	Sensitive	69.2	RW	77	165
2	Lark Ellen Av.	s/o Cypress St.	Sensitive	68.6	RW	70	150
3	Lark Ellen Av.	s/o San Bernardino Rd.	Sensitive	69.6	RW	81	175
4	Lark Ellen Av.	n/o Puente Av.	Sensitive	70.4	43	92	198
5	Rimsdale Av.	s/o San Bernardino Rd.	Non-Sensitive	61.5	RW	RW	51
6	Azusa Av.	n/o Cypress St.	Non-Sensitive	69.0	RW	93	200
7	Azusa Av.	n/o San Bernardino Rd.	Non-Sensitive	68.9	RW	92	197
8	Azusa Av.	s/o Badillo St	Sensitive	69.3	RW	97	209
9	Azusa Av.	s/o Puente Av.	Sensitive	70.0	50	107	231
10	Hollenbeck Av.	n/o San Bernardino Rd.	Sensitive	67.3	RW	57	123
11	Hollenbeck Av.	s/o Badillo St	Sensitive	66.9	RW	54	116
12	San Bernardino Rd.	w/o Lark Ellen Av.	Sensitive	70.0	40	86	186
13	San Bernardino Rd.	e/o Rimsdale Av.	Non-Sensitive	68.7	RW	70	152
14	San Bernardino Rd.	e/o Hollenbeck Av.	Sensitive	65.8	RW	46	98
15	Badillo St.	w/o Lark Ellen Av.	Sensitive	69.7	RW	102	221
16	Badillo St.	w/o Azusa Av.	Sensitive	68.7	RW	88	190
17	Badillo St.	e/o Armel Dr.	Sensitive	68.5	RW	85	183
18	Puente Av.	w/o Lark Ellen Av.	Sensitive	66.5	RW	63	135
19	Puente Av.	e/o Azusa Av.	Sensitive	67.2	RW	56	121

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

7.2 EXISTING PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report to fully analyze all the existing traffic scenarios identified in the *Covina Bowl Transportation and Parking Analysis*. 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 61.0 to 69.8 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 61.0 to 69.8 dBA CNEL. Table 7-5 shows that the Project off-site traffic noise level impacts will range from 0.0 to 0.1 dBA CNEL.

7.3 FUTURE 2024 CUMULATIVE PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the Future 2024 Cumulative without Project conditions CNEL noise levels. The Future 2024 Cumulative without Project exterior noise levels are expected to range from 61.2 to 70.0 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the Future 2024 Cumulative with Project conditions will range from 61.2 to 70.0 dBA CNEL. Table 7-6 shows that the Project off-site traffic noise level increases will range from 0.0 to 0.1 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

7.4 FUTURE 2040 GENERAL PLAN PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-5 presents the Future 2040 General Plan without Project conditions CNEL noise levels. The Future 2040 General Plan without Project exterior noise levels are expected to range from 61.5 to 70.4 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-6 shows the Future 2040 General Plan with Project conditions will range from 61.5 to 70.4 dBA CNEL. Table 7-9 shows that the Project off-site traffic noise level increases will range from 0.0 to 0.2 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

TABLE 7-7: EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Noise-Sensitive Land Use?	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
					No Project	With Project	Project Addition	Limit	Exceeded?
1	Lark Ellen Av.	n/o Cypress St.	Sensitive	Yes	68.6	68.6	0.0	1.5	No
2	Lark Ellen Av.	s/o Cypress St.	Sensitive	Yes	68.0	68.0	0.0	1.5	No
3	Lark Ellen Av.	s/o San Bernardino Rd.	Sensitive	Yes	69.0	69.0	0.0	1.5	No
4	Lark Ellen Av.	n/o Puente Av.	Sensitive	Yes	69.8	69.8	0.0	1.5	No
5	Rimsdale Av.	s/o San Bernardino Rd.	Non-Sensitive	No	61.0	61.0	0.0	5.0	No
6	Azusa Av.	n/o Cypress St.	Non-Sensitive	No	68.4	68.4	0.0	5.0	No
7	Azusa Av.	n/o San Bernardino Rd.	Non-Sensitive	No	68.3	68.3	0.0	5.0	No
8	Azusa Av.	s/o Badillo St	Sensitive	Yes	68.7	68.7	0.0	1.5	No
9	Azusa Av.	s/o Puente Av.	Sensitive	Yes	69.3	69.3	0.0	1.5	No
10	Hollenbeck Av.	n/o San Bernardino Rd.	Sensitive	Yes	66.7	66.7	0.0	1.5	No
11	Hollenbeck Av.	s/o Badillo St	Sensitive	Yes	66.3	66.3	0.0	1.5	No
12	San Bernardino Rd.	w/o Lark Ellen Av.	Sensitive	Yes	69.1	69.2	0.1	1.5	No
13	San Bernardino Rd.	e/o Rimsdale Av.	Non-Sensitive	No	67.9	67.9	0.0	5.0	No
14	San Bernardino Rd.	e/o Hollenbeck Av.	Sensitive	Yes	65.0	65.0	0.0	1.5	No
15	Badillo St.	w/o Lark Ellen Av.	Sensitive	Yes	69.0	69.1	0.1	1.5	No
16	Badillo St.	w/o Azusa Av.	Sensitive	Yes	68.0	68.1	0.1	1.5	No
17	Badillo St.	e/o Armel Dr.	Sensitive	Yes	67.8	67.8	0.0	1.5	No
18	Puente Av.	w/o Lark Ellen Av.	Sensitive	Yes	65.8	65.8	0.0	1.5	No
19	Puente Av.	e/o Azusa Av.	Sensitive	Yes	66.6	66.6	0.0	1.5	No

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

TABLE 7-8: FUTURE 2024 CUMULATIVE WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Noise-Sensitive Land Use?	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
					No Project	With Project	Project Addition	Limit	Exceeded?
1	Lark Ellen Av.	n/o Cypress St.	Sensitive	Yes	68.8	68.9	0.1	1.5	No
2	Lark Ellen Av.	s/o Cypress St.	Sensitive	Yes	68.2	68.3	0.1	1.5	No
3	Lark Ellen Av.	s/o San Bernardino Rd.	Sensitive	Yes	69.2	69.2	0.0	1.5	No
4	Lark Ellen Av.	n/o Puente Av.	Sensitive	Yes	70.0	70.0	0.0	1.5	No
5	Rimsdale Av.	s/o San Bernardino Rd.	Non-Sensitive	No	61.2	61.2	0.0	5.0	No
6	Azusa Av.	n/o Cypress St.	Non-Sensitive	No	68.6	68.7	0.1	5.0	No
7	Azusa Av.	n/o San Bernardino Rd.	Non-Sensitive	No	68.6	68.6	0.0	5.0	No
8	Azusa Av.	s/o Badillo St	Sensitive	Yes	69.0	69.0	0.0	1.5	No
9	Azusa Av.	s/o Puente Av.	Sensitive	Yes	69.6	69.6	0.0	1.5	No
10	Hollenbeck Av.	n/o San Bernardino Rd.	Sensitive	Yes	67.0	67.0	0.0	1.5	No
11	Hollenbeck Av.	s/o Badillo St	Sensitive	Yes	66.6	66.6	0.0	1.5	No
12	San Bernardino Rd.	w/o Lark Ellen Av.	Sensitive	Yes	69.5	69.6	0.1	1.5	No
13	San Bernardino Rd.	e/o Rimsdale Av.	Non-Sensitive	No	68.2	68.2	0.0	5.0	No
14	San Bernardino Rd.	e/o Hollenbeck Av.	Sensitive	Yes	65.4	65.5	0.1	1.5	No
15	Badillo St.	w/o Lark Ellen Av.	Sensitive	Yes	69.3	69.3	0.0	1.5	No
16	Badillo St.	w/o Azusa Av.	Sensitive	Yes	68.3	68.3	0.0	1.5	No
17	Badillo St.	e/o Armel Dr.	Sensitive	Yes	68.0	68.1	0.1	1.5	No
18	Puente Av.	w/o Lark Ellen Av.	Sensitive	Yes	66.1	66.1	0.0	1.5	No
19	Puente Av.	e/o Azusa Av.	Sensitive	Yes	66.8	66.8	0.0	1.5	No

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

TABLE 7-9: FUTURE 2040 GENERAL PLAN WITH SPECIFIC PLAN BUILDOUT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Noise-Sensitive Land Use?	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
					No Project	With Project	Project Addition	Limit	Exceeded?
1	Lark Ellen Av.	n/o Cypress St.	Sensitive	Yes	69.2	69.2	0.0	1.5	No
2	Lark Ellen Av.	s/o Cypress St.	Sensitive	Yes	68.6	68.6	0.0	1.5	No
3	Lark Ellen Av.	s/o San Bernardino Rd.	Sensitive	Yes	69.5	69.6	0.1	1.5	No
4	Lark Ellen Av.	n/o Puente Av.	Sensitive	Yes	70.4	70.4	0.0	1.5	No
5	Rimsdale Av.	s/o San Bernardino Rd.	Non-Sensitive	No	61.5	61.5	0.0	5.0	No
6	Azusa Av.	n/o Cypress St.	Non-Sensitive	No	69.0	69.0	0.0	5.0	No
7	Azusa Av.	n/o San Bernardino Rd.	Non-Sensitive	No	68.9	68.9	0.0	5.0	No
8	Azusa Av.	s/o Badillo St	Sensitive	Yes	69.3	69.3	0.0	1.5	No
9	Azusa Av.	s/o Puente Av.	Sensitive	Yes	69.9	70.0	0.1	1.5	No
10	Hollenbeck Av.	n/o San Bernardino Rd.	Sensitive	Yes	67.3	67.3	0.0	1.5	No
11	Hollenbeck Av.	s/o Badillo St	Sensitive	Yes	66.9	66.9	0.0	1.5	No
12	San Bernardino Rd.	w/o Lark Ellen Av.	Sensitive	Yes	69.9	70.0	0.1	1.5	No
13	San Bernardino Rd.	e/o Rimsdale Av.	Non-Sensitive	No	68.5	68.7	0.2	5.0	No
14	San Bernardino Rd.	e/o Hollenbeck Av.	Sensitive	Yes	65.8	65.8	0.0	1.5	No
15	Badillo St.	w/o Lark Ellen Av.	Sensitive	Yes	69.6	69.7	0.1	1.5	No
16	Badillo St.	w/o Azusa Av.	Sensitive	Yes	68.6	68.7	0.1	1.5	No
17	Badillo St.	e/o Armel Dr.	Sensitive	Yes	68.4	68.5	0.1	1.5	No
18	Puente Av.	w/o Lark Ellen Av.	Sensitive	Yes	66.5	66.5	0.0	1.5	No
19	Puente Av.	e/o Azusa Av.	Sensitive	Yes	67.2	67.2	0.0	1.5	No

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

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8 ON-SITE NOISE ANALYSIS

An on-site exterior noise impact analysis has been completed to determine the noise exposure levels that would result from adjacent traffic noise sources in the Project study area, and to identify potential noise mitigation measures that would achieve acceptable Project exterior and interior noise levels. The primary source of traffic noise affecting the Project site is anticipated to be from San Bernardino Road, Badillo Street and Rimsdale Avenue. The Project would also be exposed to nominal traffic noise from the Project's internal local streets. However, due to the distance, topography and low traffic volume/speed, traffic noise from these roads will not make a substantive contribution to ambient noise conditions. This section analyzes on-site exterior and interior noise levels at the Project buildings.

8.1 EXTERIOR NOISE ANALYSIS

Using the FHWA traffic noise prediction model, and the parameters outlined in Section 6, the expected future exterior noise levels at the first-floor building façades were calculated. Table 8-1 presents a summary of future exterior noise level impacts at the first-floor receiver locations. The on-site transportation noise level impacts indicate that the unmitigated exterior noise levels will range from 54.7 to 66.9 dBA CNEL. The on-site traffic noise analysis calculations are provided in Appendix 8.1.

No exterior noise mitigation is required to satisfy the City of Covina General Plan Noise Element exterior land use/noise level compatibility criteria for multi-family residential uses. As shown on Table 8-1, the Project residential uses facing San Bernardino Road and Badillo Street are shown to experience *conditionally acceptable* exterior noise levels of 54.4 to 67.1 dBA CNEL. For *conditionally acceptable* exterior noise levels the land use compatibility criteria require that *new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.* To demonstrate that the Project satisfies these requirements, additional interior noise analysis is provided in this noise study to satisfy the General Plan Noise Element interior noise level standards. (12)

TABLE 8-1: EXTERIOR TRAFFIC NOISE LEVELS

Unit	Roadway	First-Floor Unmitigated Noise Level (dBA CNEL)	Noise Element Land Use Compatibility[1]	Resulting Requirements[1]
98	San Bernardino Rd.	65.7	*Conditionally Acceptable*	Interior Analysis
55	Badillo St.	67.1	*Conditionally Acceptable*	Interior Analysis
131	Rimsdale Av.	54.4	*Normally Acceptable*	none

[1] Based on the Land Use Noise Compatibility Criteria for Multi-Family Residential (OPR General Plan Guidelines as shown on Exhibit 3-A).

8.2 INTERIOR NOISE ANALYSIS

To ensure that the interior noise levels comply with the City of Covina interior noise level standards, future noise levels were calculated at the first, second and third-floor building façades.

8.2.1 NOISE REDUCTION METHODOLOGY

The interior noise level is the difference between the predicted exterior noise level at the building façade 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." (7) (22) 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 CALIFORNIA BUILDING CODE INTERIOR NOISE LEVEL ASSESSMENT (CNEL)

Tables 8-2, 8-3 and 8-4 describe the 24-hour CNEL transportation related noise levels to demonstrate compliance with the California Building Code 45 dBA CNEL interior noise standards. The 24-hour interior noise level assessment shows that the future interior noise levels at the first, second and third floor are expected to range from 28.8 to 42.1 dBA CNEL. The interior noise level assessment shows that the California Building Code 45 dBA CNEL interior noise level standard can be satisfied using standard building construction providing windows and sliding glass doors with minimum STC ratings of 27.

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

Unit	Noise Level at Façade[1]	Required Interior Noise Reduction[2]	Estimated Interior Noise Reduction[3]	Upgraded Windows[4]	Interior Noise Level[5]
98	65.7	20.7	25.0	No	40.7
55	67.1	22.1	25.0	No	42.1
131	54.4	9.4	25.0	No	29.4

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

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

Unit	Noise Level at Façade[1]	Required Interior Noise Reduction[2]	Estimated Interior Noise Reduction[3]	Upgraded Windows[4]	Interior Noise Level[5]
98	65.5	20.5	25.0	No	40.5
55	66.9	21.9	25.0	No	41.9
131	54.3	9.3	25.0	No	29.3

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

TABLE 8-4: THIRD-FLOOR INTERIOR NOISE LEVELS (CNEL)

Unit	Noise Level at Façade[1]	Required Interior Noise Reduction[2]	Estimated Interior Noise Reduction[3]	Upgraded Windows[4]	Interior Noise Level[5]
98	65.1	20.1	25.0	No	40.1
55	66.6	21.6	25.0	No	41.6
131	53.8	8.8	25.0	No	28.8

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

8.2.3 CITY OF COVINA INTERIOR NOISE LEVEL ASSESSMENT (LEQ)

Tables 8-5, 8-6 and 8-7 describe the hourly daytime and nighttime L_{eq} transportation related noise levels to demonstrate compliance with interior noise level limits establish by the City of Covina Municipal Code, Section 9.40.060 as shown on Table 3-1. The hourly L_{eq} interior noise level assessment shows that the future daytime exterior noise levels at the first, second and third-floor are expected to range from 27.7 to 40.8 dBA L_{eq} and will satisfy the 45 dBA L_{eq} daytime interior noise level standards. The future nighttime exterior noise levels at the first, second and third-floor building façades are expected to range from 19.9 to 34.9 dBA L_{eq} and will satisfy the 35 dBA L_{eq} nighttime interior noise level standards. The interior noise level assessment shows that the City of Covina Municipal Code interior noise level standards can be satisfied using standard building construction providing windows and sliding glass doors with minimum STC ratings of 27.

TABLE 8-5: FIRST-FLOOR INTERIOR NOISE IMPACTS (LEQ)

Unit	Exterior Noise Levels (dBA Leq)[1]		Interior Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)[3]		Noise Level Standards Exceeded?[4]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
98	64.5	56.6	39.5	31.6	45	35	No	No
55	65.8	58.0	40.8	33.0	45	35	No	No
131	53.3	45.5	28.3	20.5	45	35	No	No

[1] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation.
[2] A minimum of 25 dBA exterior to interior noise reduction is assumed with standard building construction.
[3] City of Covina Municipal Code, Section 9.40.040A Interior noise level limits (Table 3-1).
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

TABLE 8-6: SECOND-FLOOR INTERIOR NOISE IMPACTS (LEQ)

Receiver Location	Exterior Noise Levels (dBA Leq)[1]		Interior Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)[3]		Noise Level Standards Exceeded?[4]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
98	64.3	56.5	39.3	31.5	45	35	No	No
55	65.7	59.9	40.7	34.9	45	35	No	No
131	53.1	45.3	28.1	20.3	45	35	No	No

[1] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation.
[2] A minimum of 25 dBA exterior to interior noise reduction is assumed with standard building construction.
[3] City of Covina Municipal Code, Section 9.40.040A Interior noise level limits (Table 3-1).
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

TABLE 8-7: THIRD-FLOOR INTERIOR NOISE IMPACTS (LEQ)

Unit	Exterior Noise Levels (dBA Leq)[1]		Interior Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)[3]		Noise Level Standards Exceeded?[4]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
98	63.9	56.1	38.9	31.1	45	35	No	No
55	65.3	57.5	40.3	32.5	45	35	No	No
131	52.7	44.9	27.7	19.9	45	35	No	No

[1] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation.
[2] A minimum of 25 dBA exterior to interior noise reduction is assumed with standard building construction.
[3] City of Covina Municipal Code, Section 9.40.040A Interior noise level limits (Table 3-1).
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

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9 RECEIVER LOCATIONS

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

Receiver locations are located in outdoor living areas (e.g., backyards) at 10 feet from any existing or proposed barriers or at the building façade, whichever is closer to the Project site, based on FHWA guidance, and consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Sensitive receiver locations in the Project study area include residential uses as described below. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the project boundary to each receiver location.

R1: Location R1 represents the existing noise sensitive residence at 1123 W San Bernardino Road, approximately 201 feet northwest of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R1 is placed at the residential building façade. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing office building at 1041 W Badillo Street, approximately 87 feet east of the Project site. R2 is placed at building facade. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

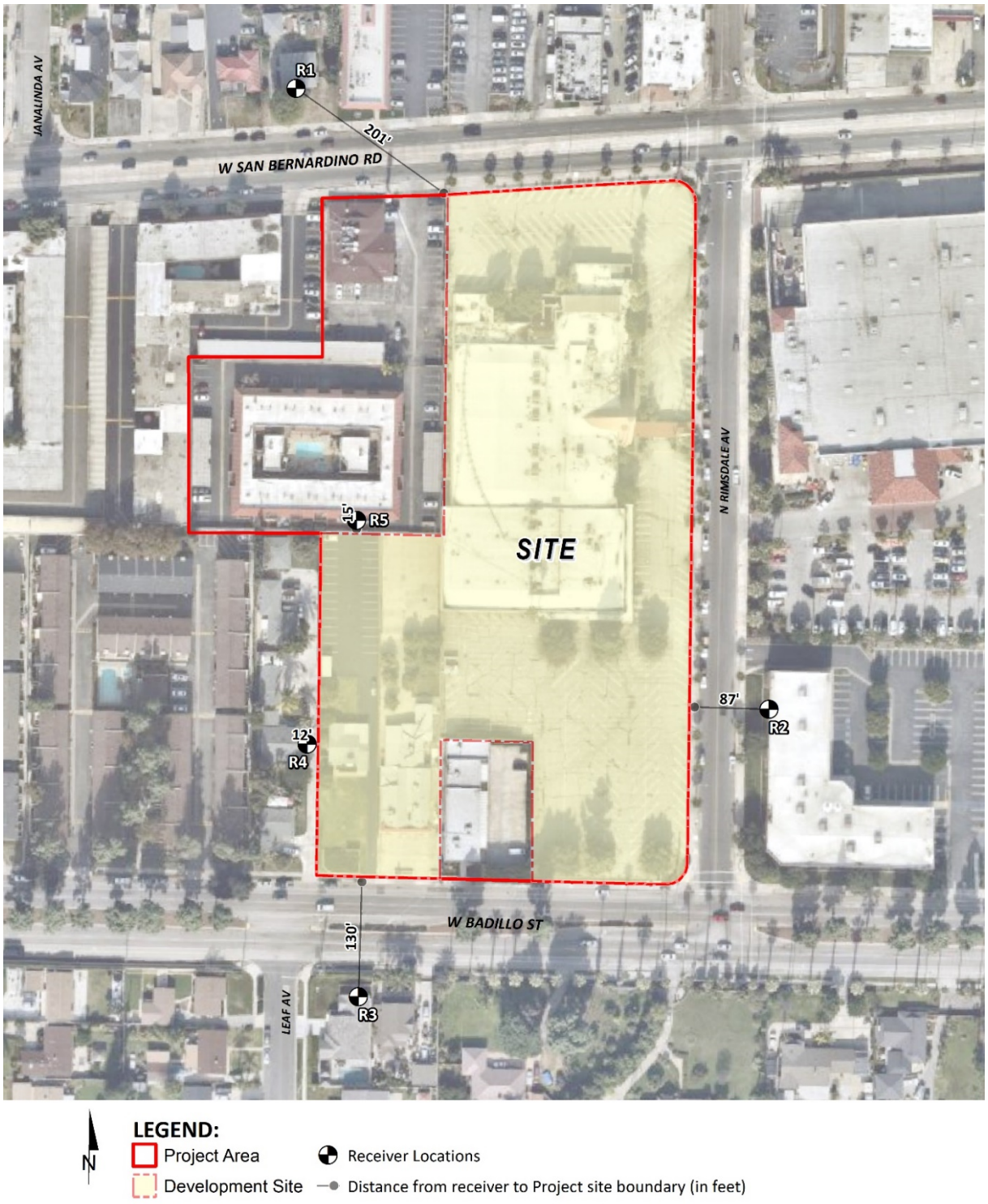
R3: Location R3 represents the existing noise sensitive residence at 1112 W Badillo Street, approximately 130 feet south of the Project site. Receiver R3 is placed at the building façade. A 24-hour noise measurement near this location, L3, is used to describe the existing ambient noise environment.

R4: Location R4 represents the existing noise sensitive residence at 1119 W Badillo Street, approximately 12 feet west of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site R4 is placed at building façade facing the Project site. A 24-hour noise measurement near this location, L4, is used to describe the existing ambient noise environment.

R5: Location R5 represents the existing Continental Garden Apartment multi-family residential community at 1108 W San Bernardino Road, within Planning Area 4,

approximately 15 feet east of the construction area within Planning Area 2. Receiver R5 is placed at the building façade. A 24-hour noise measurement near this location, L5, is used to describe the existing ambient noise environment.

EXHIBIT 9-A: RECEIVER LOCATIONS



10 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the receiver locations, identified in Section 9, resulting from the operation of the proposed Covina Bowl Project. Exhibit 10-A identifies the noise source and receiver locations used to assess the operational noise levels.

10.1 OPERATIONAL NOISE SOURCES

The proposed Project will be developed to support multi-family residential and office/coffee shop land use. It is expected that the on-site Project-related operational noise sources will be limited to the office/coffee shop uses that will generally be limited to: roof-top air conditioning units, and parking lot vehicle movements. In addition, since the Project multi-family residential land use is considered a noise-sensitive receiving land use, it is not expected to include any specific type of operational noise (stationary source). Typical residential noise sources generally include people moving around the site, vehicle movements, parking lot activity and individual air conditioning units. Therefore, no operational noise source activity for the planned multi-family residential land use are analyzed in the noise study.

10.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 10-1 used to estimate the Project operational noise impacts.

10.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using Piccolo Type 2 integrating sound level meters and dataloggers. All sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 200, was programmed in "slow" mode to record noise levels in "A" weighted form and was located at approximately five feet above the ground elevation for each measurement. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (18)

EXHIBIT 10-A: OPERATIONAL NOISE SOURCE AND RECEIVER LOCATIONS

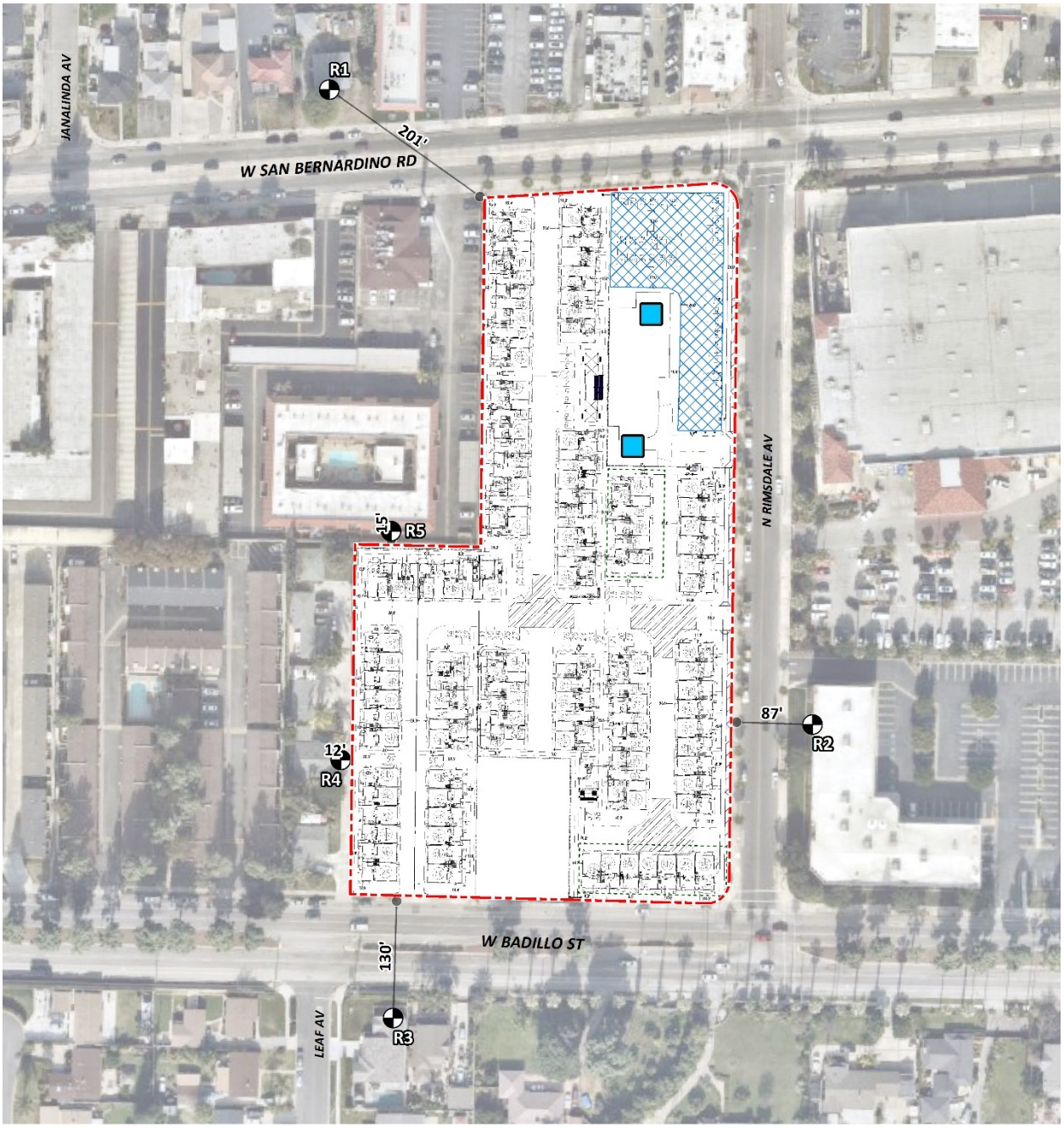


TABLE 10-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Ref. Distance (Feet)	Noise Source Height (Feet)	Min./Hour[3]		Reference Noise Level (dBA L_{eq})		Sound Power Level (dBA)[4]
				Day	Night	@ Ref. Dist.	@ 50 Feet	
Roof-Top Air Conditioning Units[1]	96:00:00	5'	5'	39	28	77.2	57.2	88.9
Parking Lot Vehicle Movements[2]	01:00:00	10'	5'	60	60	52.2	41.7	80.4

[1] As measured by Urban Crossroads, Inc. at the Santee Walmart located at 170 Town Center Parkway.
[2] As measured by Urban Crossroads, Inc. on 5/17/2017 at the Panasonic Avionics Corporation parking lot in the City of Lake Forest.
[3] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.
[4] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calculated using the CadnaA noise model at the reference distance to the noise source. Numbers may vary due to size differences between point and area noise sources.

10.2.2 Roof-Top Air Conditioning Units

To assess the impacts created by the roof-top air conditioning units at the Project buildings, reference noise levels measurements were taken over a four-day total duration at the Santee Walmart on July 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe mechanical roof-top air conditioning units on the roof of an existing Walmart store, with additional roof-top units operating in the background. The reference noise level represents Lennox SCA120 series 10-ton model packaged air conditioning units. At 5 feet from the closest roof-top air conditioning unit, the highest exterior noise level from all four days of the measurement period was measured at 77.2 dBA L_{eq}. Using the uniform reference distance of 50 feet, the noise level is 57.2 dBA L_{eq}. The operating conditions of the reference noise level measurement reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. The roof-top air condition units were observed to operate the most during the daytime hours for a total of 39 minutes per hour.

10.2.3 Parking Lot Vehicle Movements

To determine the noise levels associated with parking lot vehicle movements, Urban Crossroads collected reference noise level measurements over a 24-hour period on May 17th, 2017 at the parking lot for the Panasonic Avionics Corporation in the City of Lake Forest. The peak hour of activity measured over the 24-hour noise level measurement period occurred between 12:00 p.m. to 1:00 p.m., or the typical lunch hour for employees working in the area. The measured reference noise level at 50 feet from parking lot vehicle movements was measured at 41.7 dBA L_{eq}. The parking lot noise levels are mainly due to cars pulling in and out of spaces during peak lunch hour activity and employees talking.

10.3 CadnaA Noise Prediction Model

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially

accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.

Using the ISO 9613 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 (PWL) 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 (PWL) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish as a result of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. Hard site conditions are used in the operational noise analysis which result in noise levels that attenuate (or decrease) at a rate of 6 dBA for each doubling of distance from a point source. A default ground attenuation factor of 0.0 was used in the CadnaA noise analysis to account for hard site conditions. Appendix 10.1 includes the detailed noise model used to estimate the Project operational noise levels presented in this section.

10.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include roof-top air conditioning units, and parking lot vehicle movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. Tables 10-2 shows the Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the receiver locations are expected to range from 34.7 to 42.3 dBA L_{eq}.

TABLE 10-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)				
	R1	R2	R3	R4	R5
Roof-Top Air Conditioning Units	39.0	34.5	37.7	42.2	39.7
Parking Lot Vehicle Movements	29.7	20.7	22.2	26.7	29.1
Total (All Noise Sources)	**39.5**	**34.7**	**37.8**	**42.3**	**40.1**

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

Table 10-3 shows the Project operational noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. The nighttime hourly noise levels at the receiver locations are expected to range from 32.4 to 40.0 dBA L_{eq}. The differences between the daytime and nighttime noise levels is largely related to the duration of noise activity (Table 10-1).

TABLE 10-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)				
	R1	R2	R3	R4	R5
Roof-Top Air Conditioning Units	36.6	32.1	35.3	39.8	37.3
Parking Lot Vehicle Movements	29.7	20.7	22.2	26.7	29.1
Total (All Noise Sources)	**37.4**	**32.4**	**35.5**	**40.0**	**37.9**

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

10.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the City of Covina exterior noise level standards at noise-sensitive receiver locations. Table 10-4 shows the operational noise levels associated with Covina Bowl Project will satisfy the City of Covina 60 dBA L_{eq} daytime and 50 dBA L_{eq} nighttime exterior noise level standards at nearby residential land use and the 65 dBA L_{eq} daytime and 55 dBA L_{eq} nighttime exterior noise level standards at nearby commercial land use. Therefore, the operational noise impacts are considered *less than significant* at the noise-sensitive receiver locations.

TABLE 10-4: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Receiving Land Use	Project Operational Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)[3]		Noise Level Standards Exceeded?[4]	
		Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1	Residential	39.5	37.4	60	50	No	No
R2	Commercial	34.7	32.4	65	55	No	No
R3	Residential	37.8	35.5	60	50	No	No
R4	Residential	42.3	40.0	60	50	No	No
R5	Residential	40.1	37.9	60	50	No	No

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

10.6 PROJECT OPERATIONAL NOISE LEVEL INCREASES

To describe the Project operational noise level increases, the Project operational noise levels are combined with the existing ambient noise levels measurements for the receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (5) Instead, they must be logarithmically added using the following base equation:

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

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level increases to the existing ambient noise environment. As indicated on Tables 10-5 and 10-6, the Project will generate a daytime and nighttime operational noise level increases ranging from 0.0 to 0.5 dBA L_{eq} at the receiver locations. Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented in Table 4-1. Therefore, the incremental Project operational noise level increase is considered *less than significant* at all receiver locations.

TABLE 10-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	39.5	L1	68.6	68.6	0.0	1.5	No
R2	34.7	L2	55.0	55.0	0.0	5.0	No
R3	37.8	L3	65.2	65.2	0.0	1.5	No
R4	42.3	L4	59.5	59.6	0.1	5.0	No
R5	40.1	L5	52.4	52.6	0.2	5.0	No

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

TABLE 10-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	39.5	L1	63.1	63.1	0.0	3.0	No
R2	34.7	L2	52.0	52.1	0.1	5.0	No
R3	37.8	L3	61.6	61.6	0.0	3.0	No
R4	42.3	L4	51.7	52.2	0.5	5.0	No
R5	40.1	L5	51.1	51.4	0.3	5.0	No

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

11 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 11-A shows the construction noise source locations in relation to the sensitive receiver locations previously described in Section 9. To prevent high levels of construction noise from impacting noise-sensitive land uses, City of Covina Municipal Code Section 9.40.110(A) limits construction activities to the hours of 7:00 a.m. to 8:00 p.m. on any day except Sunday or a public holiday. In addition, due to the potential construction noise level impacts, application for a permit authorizing work is required per the City of Covina Municipal Code Section 9.40.110(B).

11.1 CONSTRUCTION NOISE LEVELS

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

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

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to more than 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver. A default ground attenuation factor of 0.0 was used in the CadnaA construction noise prediction model to account for hard site conditions.

11.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 11-1 provides a summary of the construction reference noise level measurements. Since the reference noise levels were collected at varying distances of 30 feet and 50 feet, all construction noise level measurements presented on Table 11-1 have been adjusted for consistency to describe a uniform reference distance of 50 feet.

EXHIBIT 11-A: TYPICAL CONSTRUCTION NOISE SOURCE AND RECEIVER LOCATIONS

TABLE 11-1: 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})
Demolition	Demolition Activity	67.9	71.9
	Backhoe	64.2	
	Water Truck Pass-By & Backup Alarm	71.9	
Site Preparation	Scraper, Water Truck, & Dozer Activity	75.3	75.3
	Backhoe	64.2	
	Water Truck Pass-By & Backup Alarm	71.9	
Grading	Rough Grading Activities	73.5	73.5
	Water Truck Pass-By & Backup Alarm	71.9	
	Construction Vehicle Maintenance Activities	67.5	
Building Construction	Foundation Trenching	68.2	71.6
	Framing	62.3	
	Concrete Mixer Backup Alarms & Air Brakes	71.6	
Paving	Concrete Mixer Truck Movements	71.2	71.2
	Concrete Paver Activities	65.6	
	Concrete Mixer Pour & Paving Activities	65.9	
Architectural Coating	Air Compressors	65.2	65.2
	Generator	64.9	
	Crane	62.3	

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.

11.3 TYPICAL CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA construction noise prediction model, calculations of the Project construction noise level impacts at the 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 receiver location. As shown on Table 11-2, the construction noise levels are expected to range from 67.4 to 76.4 dBA L_{eq} at the receiver locations. Appendix 11.1 includes the detailed CadnaA construction noise model inputs.

TABLE 11-2: TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	64.0	67.4	65.6	63.7	63.3	57.3	67.4
R2	66.3	69.7	67.9	66.0	65.6	59.6	69.7
R3	73.0	76.4	74.6	72.7	72.3	66.3	76.4
R4	72.6	76.0	74.2	72.3	71.9	65.9	76.0
R5	68.9	72.3	70.5	68.6	68.2	62.2	72.3

[1] Noise receiver locations are shown on Exhibit 11-A.
[2] Construction noise level calculations based on distance from the project site boundaries (construction activity area) to receiver locations. CadnaA construction noise model inputs are included in Appendix 11.1.

11.4 TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at receiver locations, a construction-related the NIOSH noise level threshold of 85 dBA L_{eq} is used as acceptable thresholds to assess construction noise level impacts. The construction noise analysis shows that the receiver locations will satisfy the 85 dBA L_{eq} significance threshold during Project construction activities as shown on Table 11-3. Therefore, the noise impacts due to Project construction noise is considered *less than significant* at all receiver locations.

TABLE 11-3: TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	67.4	85	No
R2	69.7	85	No
R3	76.4	85	No
R4	76.0	85	No
R5	72.3	85	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to receiver locations as shown on Table 10-2.
[3] Construction noise level thresholds as shown on Table 4-1.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

11.5 CONSTRUCTION VIBRATION IMPACTS

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

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

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration (FTA). Using the vibration source level of construction equipment provided on Table 6-6 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 11-3 presents the expected Project related vibration levels at each of the sensitive receiver locations.

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference velocity of 0.089 in/sec PPV at 25 feet. To assess the human perception of vibration levels in PPV the velocities are converted to RMS vibration levels based on the Caltrans *Transportation and Construction Vibration Guidance Manual* conversion factor of 0.71. At distances ranging from 12 to 201 feet from Project construction activities, construction vibration velocity levels are estimated to range from 0.0028 to 0.1900 in/sec RMS, as shown on Table 11-4.

Table 11-4 shows the highest construction vibration levels will exceed the City of Covina perceptible vibration threshold of 0.01 in/sec RMS at receiver locations R4, and R5. The Project-related vibration impacts will be *potentially significant* during the construction activities at the Project site and mitigation is required.

TABLE 11-4: UNMITIGATED PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)	Receiver Levels (in/sec) RMS[2]					Threshold (in/sec) RMS[3]	Threshold Exceeded?[4]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Peak Vibration		
R1	201'	0.0001	0.0011	0.0024	0.0028	0.0028	0.01	No
R2	87'	0.0003	0.0038	0.0083	0.0097	0.0097	0.01	No
R3	130'	0.0002	0.0021	0.0046	0.0053	0.0053	0.01	No
R4	12'	0.0064	0.0747	0.1623	0.1900	0.1900	0.01	Yes
R5	15'	0.0046	0.0535	0.1161	0.1360	0.1360	0.01	Yes

[1] Receiver locations are shown on Exhibit 11-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-6. Vibration levels in PPV are converted to RMS velocity using a 0.71 conversion factor identified in the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.
[3] City of Covina Municipal Code, Section 9.40.020(30)
[4] Does the vibration level exceed the maximum acceptable vibration threshold?

Therefore, a 90-foot buffer zone mitigation measure is required which would restrict the use of large loaded trucks, heavy mobile equipment greater than 80,000 pounds, and jack hammers within 90-feet of occupied sensitive receiver locations represented by R4 and R5 as shown on Table 11-5. With the 90-foot buffer zone, Project construction vibration levels would be reduced to 0.009 in/sec RMS, will satisfy the 0.01 in/sec RMS threshold, and represent *less than significant* impacts with mitigation.

TABLE 11-5: MITIGATED PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)	Receiver Levels (in/sec) RMS[2]					Threshold (in/sec) RMS[3]	Threshold Exceeded?[4]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Peak Vibration		
R4	90'	0.0003	0.0036	0.0079	0.0093	0.0093	0.01	No
R5	90'	0.0003	0.0036	0.0079	0.0093	0.0093	0.01	No

[1] Receiver locations are shown on Exhibit 11-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-6. Vibration levels in PPV are converted to RMS velocity using a 0.71 conversion factor identified in the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.
[3] City of Covina Municipal Code, Section 9.40.020(30)
[4] Does the vibration level exceed the maximum acceptable vibration threshold?

Moreover, the impacts 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.

12 REFERENCES

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21. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.

22. —. *Traffic Noise Analysis Protocol.* May 2011.

13 CERTIFICATION

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

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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 COVINA MUNICIPAL CODE, CHAPTER 9.40 NOISE

Chapter 9.40

NOISE[1]

Sections:

9.40.010 Declaration of policy.
9.40.020 Definitions.
9.40.030 Loud party.
9.40.031 Disturbance violation service fee.
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9.40.050 Time duration correction factors.
9.40.060 Interior noise level limits.
9.40.070 Noise measurement procedure.
9.40.080 General guidelines.
9.40.090 Controlled hours of operation.
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9.40.010 Declaration of policy.

It is declared to be the policy of the city to use its police power to reduce noise in the community by prohibiting unnecessary, excessive, and annoying noises from all sources. At certain levels, noise can be detrimental to the health, safety, welfare, and quality of life of the citizenry. Therefore, in the public interest, it shall be restricted. In order to better implement the goals of the noise element of the city's general plan and to more effectively prohibit unwanted and unnecessary sounds of all types within the community, this chapter has been amended. This chapter shall be referred to and cited as the "Covina noise ordinance." (Ord. 1665 § 2, 1988.)

9.40.020 Definitions.

Terminology used in this chapter shall be in conformance with definitions in the Covina zoning ordinance and as follows:

1. "A-weighted sound level" means the sound level in decibels as measured on a sound level meter using the A-weighting network. The level so read is designated dB(A) or dBA.

2. "Ambient noise level" means an existing level of all-encompassing noise, from sources both near and far, that is associated with a given environment. Such a noise level does not include intruding noises from isolated identifiable sources.

3. "Commercial area" means land utilized for business purposes other than residential or industrial uses.

4. "Construction" means any site preparation, assembly, erection, substantial repair, alteration, or similar action, for or of public or private rights-of-way, structures, utilities or similar property.

5. "Day-night average sound level (Ldn)" means the 24-hour average of the A-weighted sound pressure level, with levels during the period 10:00 p.m. to 7:00 a.m. the following day increased by five decibels.

6. "Decibel (dB)" means a unit for measuring the volume of a sound equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals.

7. “Demolition” means any dismantling, intentional destruction or removal of structures, utilities, public or private right-of-way surfaces, or similar property.

8. “Emergency” means any threat to the public health or safety or any unforeseen combination of circumstances, or the resulting state, that calls for immediate action as declared by the city manager.

9. “Emergency work” means any work performed necessary to restore property that has been damaged by an emergency to a safe condition.

10. “Enforcement officer” means either the chief of police or the chief planning official, or their designees, who may enforce the provisions of this chapter.

11. “Fixed noise source” means a stationary device which creates sounds, including, but not limited to, agricultural, commercial, industrial, or residential machinery and equipment, pumps, fans, compressors, air conditioners, and refrigeration equipment.

12. “Gross vehicle weight rating (GVWR)” means the value specified by the manufacturer as the recommended maximum loaded weight of a single motor vehicle. In cases where trailers and tractors are separable, the gross combination weight rating (GCWR), which is the value specified by the manufacturer as the recommended maximum loaded weight of the combination vehicle, shall be used.

13. “Impulsive sound” means a sound of short duration (usually less than one second) with an abrupt onset and rapid delay. Examples of sources of impulsive sound include explosions, drop forge impacts, and the discharge of firearms.

14. “Industrial area” means land utilized for industrial, manufacturing, wholesaling, and related uses as defined in the city’s M-1 (light manufacturing) ordinance.

15. “Intrusive noise” means a noise that intrudes over and above the existing ambient noise at a given location.

16. “Mobile noise source” means any noise source other than a fixed source.

17. “Motor vehicle” means a self-propelled vehicle as defined in the California Motor Vehicle Code, including all on-highway type motor vehicles subject to registration and all off-highway type motor vehicles subject to identification under the above code.

18. “Muffler or sound dissipative device” means a device used for the purpose of receiving exhaust gas from an internal combustion engine and reducing the noise that is emitted.

19. “Noise disturbance” means any sound that, as judged by the chief of police or the chief planning official, or their designees, (a) endangers or injures the safety of humans or animals, (b) annoys or disturbs a reasonable person of normal sensitivities, (c) endangers or injures personal or real property, or (d) violates the factors set forth in CMC 9.40.030 through 9.40.060.

20. “Noise sensitive area” means a use such as, but not limited to, a hospital, nursing home, church, school or other outdoor recreational area, or library that contains activities more sensitive to noise than most activities. Existing noise sensitive areas shall be considered as such until otherwise designated.

21. “Person” means any individual, association, partnership, corporation, or public or private entity, including any officer, employee, department, or agency of such entity.

22. “Powered model vehicle” means any self-propelled airborne, waterborne, or landborne plane, vessel, or vehicle that is not designated to carry persons, including, but not limited to, any model airplane, boat, car, or rocket.

23. “Residential area” means land that is utilized or zoned for residential purposes.

24. “Residential estate or agricultural” means land that is zoned “A” (agricultural and residential) or “E” (estate residential).

25. “Residential low density” means land that is zoned “R-1” (single-family residential).

26. “Residential medium and high density” means property that is zoned “RD” (multiple-family residential).

27. “Sound amplifying equipment” means any device used for the amplification of the human voice, music, or any other sound. Excluded are standard automobile radios when used and heard only by the occupants of the vehicle in which the radio is held or installed. Also excluded are warning devices on authorized emergency vehicles or horns or other warning devices on any vehicle used only for traffic safety purposes.

28. “Sound level meter” means an instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement of sound levels, which meets or exceeds the requirements pertinent for Type S2A meters in American National Standards Institute specifications for sound level meters, 51.4-1971, or the most recent revision thereof.

29. “Sound truck” means any motor vehicle, or any other vehicle, regardless of motive power, whether in motion or stationary, having mounted thereon or attached thereto, any sound amplifying equipment.

30. “Vibration perception threshold” means the minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observation of moving objects. The threshold shall be presumed to be a motion velocity of 0.01 inches/second over the range of one to 100 HZ.

31. “Weekday” means any day, Monday through Friday, which is not a legal holiday. (Ord. 1665 § 2, 1988.)

9.40.030 Loud party.

It is unlawful for any person or persons to make, continue or cause to be made or continued any unnecessary, loud or unusual noise which is a threat to the public peace, health, safety or general welfare of others due to a party, gathering or unruly assemblage at a premises. (Ord. 1686 § 1, 1989; Ord. 1665 § 2, 1988.)

9.40.031 Disturbance violation service fee.

A. When any loud or unruly assemblage occurs and in the event that the senior police officer at the scene determines that there is a threat to the public peace, health, safety or general welfare, then that senior officer shall personally notify the owner of the premises or the person in charge of the premises or the person responsible for the assemblage that that person, or if that person is a minor, that the parents and guardians of that person will be held personally liable for the costs of providing police personnel on special security assignment over and above the normal services provided by the police department to those premises. A first warning shall be deemed to be the normal services provided. The personnel utilized after the first warning to control the threat to the public peace, health, safety or general welfare shall be deemed to be on special security assignment over and above the normal services provided. The accounting and billing procedures as set forth in subsection (B) of this section shall apply.

B. 1. The costs of the special security assignment described in subsection (A) of this section shall include personnel and equipment costs expended during the second and any subsequent returns to the premises, including costs for the total number of officers involved and total minutes expended after the officers arrive on the scene. In addition, such costs may include damages to city property and/or injuries to city personnel. The fee assessed against said person or persons for such costs shall be in an amount that may be set from time to time by a resolution of the city council.

2. All fees and charges levied for city services described in subsection (A) of this section shall be due and payable upon presentation.

3. All fees and charges for such services shall constitute a valid and subsisting debt in favor of the city and against the owner of the premises, the person in charge of the premises and the person responsible for the assemblage or if any of the foregoing persons are a minor, the parents and guardians of that such person. If an amount remains unpaid after reasonable and practical attempts have been made by the city to obtain payment, a civil action may be filed with the court for the amount due and payable, together with any penalties, any related

charges and fees accrued due to nonpayment, and all fees and charges required to file and pursue such civil action.

4. Fees and charges shall be levied for recovering city costs for notification and collection of delinquent accounts and shall be established by resolution of the city council. Such fees and charges are a part of the fees and charges established for the services rendered and shall be collected as such.

C. If any paragraph, sentence, phrase, portion or part of this section is for any reason held to be invalid or unconstitutional by any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this section. The city council declares that it intends and desires that the remaining parts of the section continue to be effective without any parts that have been declared invalid.

D. The city reserves its legal options to elect any other legal remedies when said costs exceed $500.00. (Ord. 09-1975 § 1, 2009; Ord. 1686 § 2, 1989.)

9.40.040 Exterior noise level limits.

The allowable noise level or sound level referred to in CMC 9.40.030 shall be the higher of the following:

A. Actual measured ambient level; or

B. The sound level limit as determined from the following table:

Receiving Land Use Category	Time	Sound Level (A-Weighted) Decibels
Residential estate or agricultural	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	50 40
Residential low density	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	55 45
Residential medium and high density	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	60 50
Commercial	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	65 55
Industrial	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	70 60

1. Noises generated shall not exceed the noise standard for that land use for any period in any hour except as provided within this chapter;

2. If the measurement location is on a boundary between a commercial or industrial land use category and a residential category, the noise level limit of the lower category plus five decibels shall apply;

3. In the event the alleged offensive noise, as judged by the enforcement officer, contains a steadily, audible tone such as a whine, screech, or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech conveying informational content, the standard limits set forth in the above table shall be reduced by five decibels. (Ord. 1665 § 2, 1988.)

9.40.050 Time duration correction factors.

The time duration allowances set forth below shall apply to those noise level limits listed in the table in CMC 9.40.040 during all hours of any day. Any noise created in a manner described in CMC 9.40.030 shall not exceed:

A. The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour; or

B. The noise standard plus 10 dB(A) for a cumulative period of more than five minutes in any hour; or

C. The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour; or

D. The noise standard plus 20 dB(A) for any period. (Ord. 1665 § 2, 1988.)

9.40.060 Interior noise level limits.

A. The interior noise standards for residential dwellings as presented in the following table shall apply, unless otherwise specifically indicated, within all dwellings with windows in their closed configuration unless the unit does not have adequate heating, air conditioning and mechanical ventilation:

Allowable Interior Land Use	Time Interval	Noise Level dB(A)
Residential (All densities)	10:00 p.m. to 7:00 a.m. 7:00 a.m. to 10:00 p.m.	35 45

B. No person shall operate or cause to be operated within a dwelling unit any source of sound or allow the creation of any noise that causes the noise level, when measured inside a neighboring dwelling unit, for any cumulative period in any hour, to exceed the above standard.

C. No person shall operate or cause to be operated within a dwelling unit any source of sound or allow the creation of any noise which causes the noise level, when measured inside a neighboring receiving dwelling unit, to exceed:

1. The noise standard plus five dB for a cumulative period of more than one minute in any hour; or

2. The noise standard plus 10 dB or the maximum measured ambient, for any period of time.

D. In the event the alleged offensive noise, as judged by the noise control officer, contains a steady, audible tone such as a whine, screech, a hum, or is a repetitive noise such as hammering or riveting, or contains music or speech conveying informational content, the standard limits set forth in the above table shall be reduced by five dB.

E. No person shall construct, or cause to be constructed, in any area of the city a commercial or industrial development in an area adjacent to residential properties that will increase noise levels above the standards listed in this section and CMC 9.40.040, unless the person provides mitigation measures to reduce the increased noise levels. Prior to the issuance of building permits for such a project, a registered engineer shall certify that the construction plans provide for noise reduction features. In addition, prior to occupancy a random selection of adjacent residential units shall be tested to provide evidence that all required noise levels are achieved.

F. All newly constructed residential dwellings located in areas that are exposed to ambient noise levels in excess of 60 dB(A) LDN shall be designed and built so that all habitable rooms comply with subsection (A) of this section. (Ord. 1665 § 2, 1988.)

9.40.070 Noise measurement procedure.

Whether a complaint from a citizen or a request to inspect a noise source has been made, the enforcement officers, or their designees, may investigate the matter. The investigation shall consist of the recording of measurement(s) and the gathering of data in order to adequately define the noise problem. The investigation must include the following:

A. Type of noise source;

B. Location of noise source relative to complainant’s property;

C. Time period during which noise source is considered by complainant to be intrusive;

D. Total duration of noise produced by noise source; and

E. Date and time of noise measurement survey. (Ord. 1665 § 2, 1988.)

9.40.080 General guidelines.

Notwithstanding the provisions of CMC 9.40.030 through 9.40.060, it is unlawful for any person to make, continue, or cause to be made or continued, within the limits of the city, any loud, unnecessary or unusual noise that causes discomfort or annoyance to any reasonable person of normal sensitivity in the area.

The characteristics and conditions to be considered in determining a violation of the provisions of this section include, but are not limited to, the following:

A. The sound level of the objectionable or intrusive noise;

B. The sound level of the ambient noise;

C. Whether the nature of the objectionable noise is usual or unusual;

D. The proximity of the noise to residential sleeping facilities;

E. The nature and zoning of the area within which the noise is heard or from which it emanates;

F. The number of persons in the area within which the noise is heard or from which it emanates;

G. The time of day or night the objectionable noise occurs;

H. The duration of the noise and its tonal, informational, or music content;

I. Whether the noise is continuous, recurrent, or intermittent;

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

The above factors shall be considered in addition to the noise levels set forth in CMC 9.40.040 and 9.40.060 in determining a violation. However, noises do not necessarily need to exceed those noise level limits to be considered unnecessary or unusual so as to cause discomfort or annoyance to reasonable persons of normal sensitivity in the area. (Ord. 1665 § 2, 1988.)

9.40.090 Controlled hours of operation.

It is unlawful for any person to operate, permit, use, or cause to operate, any of the following, other than between the hours of 7:00 a.m. and 8:00 p.m. of any one day:

A. Powered model vehicles;

B. Loading and unloading vehicles such as garbage trucks, forklifts or cranes in a residential area or within 500 feet of a residence;

C. Domestic power tools;

D. Lawn equipment, including, but not limited to, lawn mowers, edgers, cultivators, chain saws, and leaf blowers in any residential area or within 500 feet of any residence;

E. Equipment associated with the repair and maintenance of real property. (Ord. 1665 § 2, 1988.)

9.40.100 Noise sensitive areas.

It is unlawful for any person to create, maintain, or cause to be created or maintained any noise or sound near any school, outdoor recreational area, library, hospital, nursing home, or church while any of the above is in use, which exceeds the noise standards as specified in CMC 9.40.040 prescribed for the residential low density land use category; or which noise level unreasonably interferes with the working of such installations or which disturbs or unduly annoys patients in the hospital or nursing home; provided, conspicuous signs are displayed on such street, sidewalk, or public place indicating the presence of a school, hospital, nursing home, or church. (Ord. 1665 § 2, 1988.)

9.40.110 Construction.

A. It is unlawful for any person within any residential land use category or within a radius of 500 feet therefrom to operate equipment or perform any outside construction or repair work on any building, structure, or project; or to operate any pile driver, steam shovel, pneumatic hammer, electric saw, grinder, steam or electric hoist, or other construction-type equipment or device between the hours of 8:00 p.m. of any one day and 7:00 a.m. of the next day, at any time on any Sunday or at any time on any public holiday in such a manner that a reasonable person of normal sensitivity residing in the area is caused discomfort or annoyance, unless beforehand a permit therefor has been duly obtained in accordance with the provisions of subsection (B) of this section. No permit shall be required to perform emergency work.

"Public holiday" as used in this subsection shall mean the day upon which each of the following holidays is recognized and celebrated as a holiday by the employees of the city: Independence Day, Labor Day, Veterans Day, Thanksgiving, Christmas Eve, Christmas Day, New Year's Eve, New Year's Day, Washington's Birthday, Memorial Day, or any other holiday recognized as such by the city.

B. A permit may be issued authorizing the work prohibited by this section whenever it is found that the public interest will be served thereby. An application for such a permit shall be in writing and shall be accompanied by an application fee in an amount that may be set from time to time by a resolution of the city council. The application shall set forth in detail facts showing that the public interest will be served by the issuance of such permit, and the application shall be made to the planning division of the community development department. The chief planning official shall be responsible for the administration and enforcement of the provisions of this section and shall have the authority to issue such permits. He/she shall coordinate the processing of each application for a permit with such departments and divisions as he/she deems will be affected by the issuance of the permit. (Ord. 09-1975 § 1, 2009; Ord. 1665 § 2, 1988.)

9.40.120 Loud and/or unusual noises.

The following acts, among other things, are declared to be loud, disturbing and unnecessary noises in violation of CMC 9.40.080, but said enumeration shall not be deemed to be exclusive:

A. Mufflers – Sound Dissipative Devices. No person shall operate or cause to be operated any motor vehicle in violation of the exhaust noise levels as established by the State of California Vehicle Code Division 12, Chapter 5, Article 2, or any successor thereto.

B. Horns and Signaling Devices. No person shall operate or cause to be operated any motor vehicle horn, siren, or amplification device in violation of the State of California Vehicle Code Division 12, Chapter 5, Article 1 or any successor thereto.

C. Motorized Recreational Vehicles Operating off Public Right-of-Way. No person shall operate or cause to be operated any motorized recreational vehicle off a public right-of-way in such a manner that the sound levels emitted therefrom violate the provisions of this chapter.

D. Standing Motor Vehicles. No person shall operate or permit the operation of any motor vehicle with a gross vehicle weight (GVWR) in excess of 10,000 pounds, or of any auxiliary equipment attached to such a vehicle, for a period longer than 15 minutes in any hour between the hours of 7:00 p.m. of one day and 7:00 a.m. of the next day while the vehicle is stationary and within 150 feet of a residential area or designated noise sensitive area, except when movement of said vehicle is restricted by other traffic. This provision shall not apply to vehicles owned and operated by utility companies regulated by the California Public Utilities Commission. It shall also not apply to garbage trucks and street sweepers.

E. Vehicle or Motorboat Repairs and Testing. It is unlawful for any person to repair, rebuild, modify, or test any motor vehicle, motorcycle or motorboat in such a manner as to cause a noise level that exceeds the standards listed in CMC 9.40.030 through 9.40.060.

F. Hawkers and Peddlers. It is unlawful for any person to sell anything by outcry within any area of the city utilized for residential or commercial purposes. This section shall not be construed to prohibit the selling by outcry of merchandise, food and beverages at licensed sporting events, parades, fairs, circuses, and similar licensed public entertainment events or auctions.

G. Use of Sound Devices on Vehicles for the Purpose of Advertising Goods or Attracting or Calling Attention to Such Vehicle. No person at any time shall operate, drive, or park, or cause to be operated, driven, or parked, upon any street, sidewalk, or public property within the city any advertising vehicle or commercial vehicle with its sound amplifying equipment in operation for the purpose of advertising goods, wares, or merchandise sold at or from such vehicle, or for the purpose of attracting or calling attention to such vehicle for the purpose of selling goods, wares, or merchandise. Also, no person shall make, or cause, permit, or allow to be made, any noise of any kind by means of any whistle, rattle, bell, gong, clapper, hammer, drum, horn, megaphone, or similar mechanical device, for the purpose of advertising or selling any goods, wares, or merchandise, or of attracting the attention or inviting the patronage of any person, from any vehicle which is driven, operated, or parked upon any street, sidewalk, or public property within the city.

H. Animals and Fowl. No person shall keep or maintain, or permit the keeping of, upon any premises, owned, occupied, or controlled by such person any animal or fowl otherwise permitted to be kept, which by any sound, cry or behavior shall cause discomfort or annoyance to any reasonable person of normal sensitivity in the area.

I. Mechanical and Electrical Equipment. All such equipment, including air conditioners, pumps, transformers, antennas, and heating and ventilating systems, shall be located and operated in a manner that does not disturb adjacent uses and activities. The noise level generated from any mechanical or electrical equipment shall not exceed the standards listed in CMC 9.40.030 through 9.40.060. This provision shall not apply to mechanical and electrical equipment owned and operated by utility companies regulated by the California Public Utilities Commission.

J. Vibration. It is unlawful to operate or permit the operation of any device that creates a vibration that is above the vibration perception threshold of an average individual at or beyond the property boundary of the source if on private property or at 150 feet from the source if on a public space or public right-of-way. (Ord. 97-1810 § 3 1997; Ord. 1665 § 2, 1988.)

9.40.130 Truck routes.

In order to prevent unnecessary noise and vibration on residential local and collector streets, Chapter 10.44 CMC, which establishes truck routes throughout the city, shall be followed. (Ord. 1665 § 2, 1988.)

9.40.140 Exceptions.

The following noise sources are specifically excluded from the standards and provisions documented in CMC 9.40.030 through 9.40.080 and 9.40.100:

A. The emission of sound for the purpose of alerting persons to the existence of an emergency, or the emission of sound in the performance of emergency work;

B. Domestic power tools;

C. Lawn equipment including, but not limited to, lawn mowers, edgers, cultivators, chainsaws, and leaf blowers in any residential area;

D. Cars, trucks, and buses on residential streets, providing such vehicles do not violate California exhaust noise levels;

E. Noise sources associated with the maintenance of real property;

F. City- or school-approved activities conducted on public parks, public playgrounds, and public or private school grounds, including athletic and school entertainment events; however, the city shall reasonably address noise impacts at city-sponsored events;

G. Occasional outdoor gatherings, dances, shows, fairs, and fundraising promotional sales, and seasonal sales activities; provided, said events are conducted pursuant to the approval of an administrative conditional use permit by the city;

H. Any activity to the extent regulation thereof has been preempted by state or federal law;

I. Noise associated with the operation of garbage trucks and street sweepers;

J. Any noise generated from an activity, device, or vehicle that pertains to the functioning of a utility company regulated by the California Public Utilities Commission. However, in the event complaints about a utility company operation, activity or equipment arise, the company in question shall attempt to resolve the problem as expeditiously as possible;

K. Any activity conducted by personnel from the city of Covina, the county of Los Angeles, a regional agency, or a special district, whether the activity is conducted on public or private property. (Ord. 11-1995 § 8, 2011; Ord. 1665 § 2, 1988.)

9.40.150 Pre-existing noise sources.
Those residential, commercial and/or industrial noise sources in existence prior to the date of adoption of this chapter or annexation by the city, which exceed the levels specified in this chapter, shall have a five-year period from the date of adoption with which to comply with the chapter. If at the end of the five-year period it can be shown that compliance with the provisions of this chapter constitutes a hardship in terms of technical and economic feasibility, the time to comply may be extended by the city council following a hearing on the matter on an annual basis until such time as compliance may be effected. However, this amortization process shall not apply to intrusive noise sources that have been identified as such by city officials prior to the date of adoption of this chapter or date of annexation. (Ord. 1665 § 2, 1988.)

9.40.160 Violations.
Any person violating any provision of this chapter shall be deemed guilty of an infraction. (Ord. 1665 § 2, 1988.)

9.40.170 Continuing or subsequent violations.
Any person having been convicted of a violation of any provision of this chapter who thereafter commits a violation of the same provision of this chapter shall be guilty of a misdemeanor. (Ord. 1665 § 2, 1988.)

9.40.180 Severability.
If any provision of this chapter is held to be unconstitutional or otherwise invalid by any court of competent jurisdiction, the remaining provisions of the chapter shall not be invalidated. (Ord. 1665 § 2, 1988.)

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[1] For statutory provisions regarding disturbing the peace and noise, see Penal Code § 415.

APPENDIX 5.1:

STUDY AREA PHOTOS

JN:12965 Study Area Photos

L1_E
34, 5' 19.980000", 117, 54' 46.370000"

L1_N
34, 5' 15.230000", 117, 54' 40.930000"

L1_S
34, 5' 19.980000", 117, 54' 46.370000"

L1_W
34, 5' 20.000000", 117, 54' 46.260000"

L2_E
34, 5' 14.350000", 117, 54' 35.900000"

L2_N
34, 5' 14.330000", 117, 54' 35.930000"

JN:12965 Study Area Photos

L2_S
34, 5' 14.350000", 117, 54' 35.930000"

L2_W
34, 5' 14.350000", 117, 54' 35.900000"

L3_E
34, 5' 10.530000", 117, 54' 43.840000"

L3_N
,

L3_S
34, 5' 10.530000", 117, 54' 43.840000"

L3_W
34, 5' 10.600000", 117, 54' 43.760000"

JN:12965 Study Area Photos

L4_E
34, 5' 12.790000", 117, 54' 44.690000"

L4_N
34, 5' 12.780000", 117, 54' 44.690000"

L4_S
34, 5' 12.790000", 117, 54' 44.690000"

L4_W
34, 5' 12.810000", 117, 54' 44.720000"

L5_E
34, 5' 16.820000", 117, 54' 44.500000"

L5_N
34, 5' 19.650000", 117, 54' 46.260000"

JN:12965 Study Area Photos

L5_S
34, 5' 19.650000", 117, 54' 46.260000"

L5_W
34, 5' 17.000000", 117, 54' 44.250000"

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

24-Hour Noise Level Measurement Summary

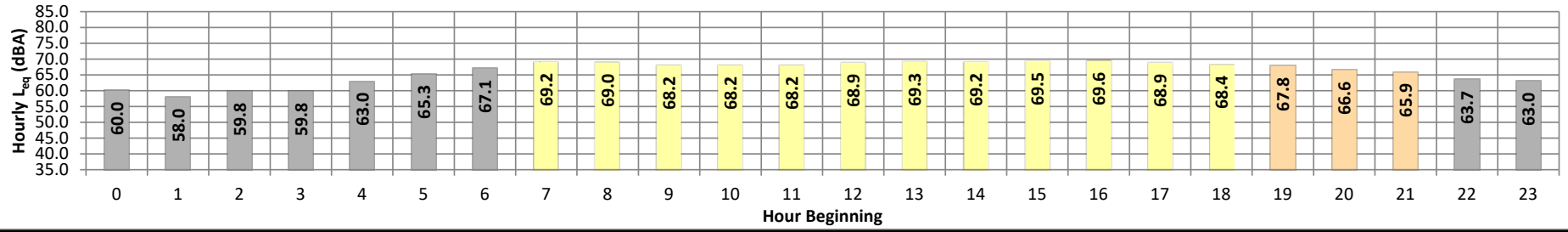
Date: Wednesday, May 06, 2020
Project: Covina Bowl

Location: L1 - Located north of the Project site on West San Bernardino Road near existing single-family home at 1123 West San Bernardino Road.

Meter: Piccolo II

JN: 12965
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	60.0	72.0	46.3	71.2	70.3	67.8	65.9	57.8	50.1	46.6	46.5	46.4	60.0	10.0	70.0
	1	58.0	70.3	46.2	69.6	68.6	65.6	63.7	54.6	48.4	46.4	46.3	46.2	58.0	10.0	68.0
	2	59.8	72.5	47.4	71.7	70.4	67.2	64.9	56.9	52.0	48.3	48.0	47.5	59.8	10.0	69.8
	3	59.8	72.3	47.4	71.4	70.2	67.3	65.4	57.2	50.5	47.9	47.7	47.4	59.8	10.0	69.8
	4	63.0	74.6	48.5	73.9	73.1	70.6	68.9	60.7	54.2	49.2	48.8	48.6	63.0	10.0	73.0
	5	65.3	76.3	50.7	75.5	74.5	72.5	71.0	65.0	58.7	51.6	51.2	50.8	65.3	10.0	75.3
	6	67.1	77.2	52.6	76.5	75.6	73.7	72.4	67.5	62.3	54.0	53.3	52.7	67.1	10.0	77.1
Day	7	69.2	78.4	57.1	77.8	77.0	75.3	74.0	69.7	65.6	59.8	58.7	57.4	69.2	0.0	69.2
	8	69.0	78.3	52.0	77.7	76.9	75.3	74.1	70.0	64.8	55.0	53.1	52.1	69.0	0.0	69.0
	9	68.2	76.9	51.8	76.3	75.6	74.2	73.1	69.3	65.0	54.9	53.3	52.0	68.2	0.0	68.2
	10	68.2	76.8	53.7	76.1	75.4	73.8	72.9	69.4	65.3	57.0	55.2	54.0	68.2	0.0	68.2
	11	68.2	76.1	54.0	75.5	74.9	73.6	72.7	69.5	66.0	57.4	55.5	54.2	68.2	0.0	68.2
	12	68.9	76.8	53.9	76.3	75.7	74.2	73.4	70.2	66.7	57.6	55.6	54.2	68.9	0.0	68.9
	13	69.3	77.4	56.2	77.0	76.3	74.8	73.9	70.5	66.9	59.3	57.9	56.5	69.3	0.0	69.3
	14	69.2	77.9	56.7	77.4	76.6	74.7	73.7	70.2	66.5	59.0	57.8	56.9	69.2	0.0	69.2
	15	69.5	79.4	55.1	78.6	77.5	75.1	73.6	70.2	66.9	58.6	56.9	55.3	69.5	0.0	69.5
	16	69.6	77.4	56.3	76.9	76.3	74.7	73.8	71.1	67.7	59.0	57.6	56.5	69.6	0.0	69.6
	17	68.9	77.1	55.4	76.5	75.8	74.4	73.3	70.2	66.3	58.1	56.7	55.6	68.9	0.0	68.9
	18	68.4	76.3	54.4	75.6	74.9	73.7	73.0	70.0	66.1	57.7	56.1	54.7	68.4	0.0	68.4
Evening	19	67.8	76.4	53.4	75.8	75.0	73.6	72.4	68.8	65.0	56.7	55.1	53.5	67.8	5.0	72.8
	20	66.6	75.8	51.1	75.1	74.4	72.9	71.9	67.5	62.4	53.5	52.1	51.3	66.6	5.0	71.6
	21	65.9	78.0	48.5	77.0	75.6	72.8	71.1	65.0	59.1	50.3	49.3	48.7	65.9	5.0	70.9
Night	22	63.7	74.8	46.9	74.1	73.0	70.8	69.3	63.2	56.6	48.0	47.4	47.0	63.7	10.0	73.7
	23	63.0	74.7	46.3	74.0	73.0	70.4	68.6	61.6	53.9	47.4	46.8	46.4	63.0	10.0	73.0

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	68.2	76.1	51.8	75.5	74.9	73.6	72.7	69.3	64.8	54.9	53.1	52.0
	Max	69.6	79.4	57.1	78.6	77.5	75.3	74.1	71.1	67.7	59.8	58.7	57.4
Energy Average		68.9	Average:		76.8	76.1	74.5	73.5	70.0	66.1	57.8	56.2	55.0
Evening	Min	65.9	75.8	48.5	75.1	74.4	72.8	71.1	65.0	59.1	50.3	49.3	48.7
	Max	67.8	78.0	53.4	77.0	75.6	73.6	72.4	68.8	65.0	56.7	55.1	53.5
Energy Average		66.8	Average:		76.0	75.0	73.1	71.8	67.1	62.1	53.5	52.2	51.2
Night	Min	58.0	70.3	46.2	69.6	68.6	65.6	63.7	54.6	48.4	46.4	46.3	46.2
	Max	67.1	77.2	52.6	76.5	75.6	73.7	72.4	67.5	62.3	54.0	53.3	52.7
Energy Average		63.1	Average:		73.1	72.1	69.5	67.8	60.5	54.1	48.8	48.4	48.1

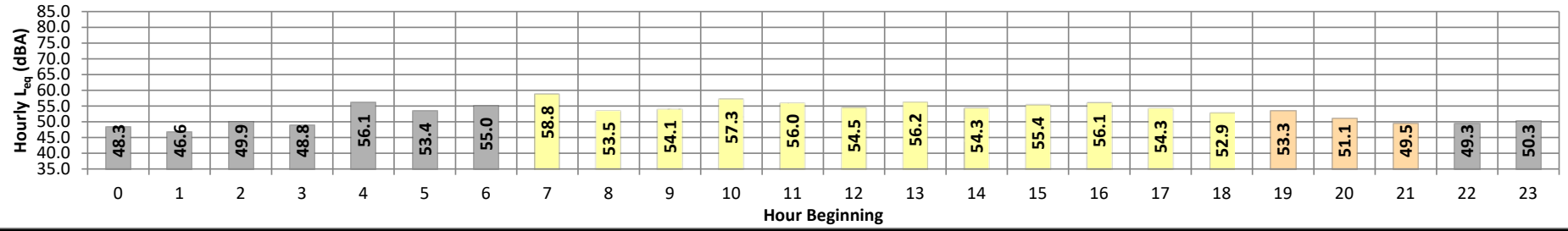
L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
67.2	68.6	63.1
24-Hour CNEL (dBA)		
71.3		

24-Hour Noise Level Measurement Summary

Date: Wednesday, May 06, 2020 *Location:* L2 - Located east of the Project site in the parking lot of Home Depot. *Meter:* Piccolo II *JN:* 12965

Project: Covina Bowl *Analyst:* P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	48.3	55.9	45.0	55.2	54.6	52.8	51.6	48.1	46.7	45.5	45.3	45.1	48.3	10.0	58.3
	1	46.6	51.8	43.8	51.6	51.3	50.5	49.6	46.8	45.5	44.3	44.1	43.9	46.6	10.0	56.6
	2	49.9	65.3	50.2	65.1	64.9	64.1	63.3	59.2	55.8	51.3	50.9	50.3	49.9	10.0	59.9
	3	48.8	54.7	45.2	54.4	54.1	52.9	51.9	49.0	47.7	45.9	45.6	45.3	48.8	10.0	58.8
	4	56.1	72.5	54.9	72.2	71.7	70.5	69.9	65.8	61.4	56.7	56.1	55.2	56.1	10.0	66.1
	5	53.4	62.1	48.9	61.7	60.8	58.3	56.9	53.0	51.4	49.6	49.3	49.0	53.4	10.0	63.4
	6	55.0	62.5	50.5	62.1	61.6	59.9	58.5	55.1	53.2	51.3	51.0	50.6	55.0	10.0	65.0
Day	7	58.8	69.7	53.1	68.7	67.4	65.0	62.6	57.2	55.5	53.8	53.6	53.2	58.8	0.0	58.8
	8	53.5	60.3	48.7	59.9	59.4	57.8	56.8	54.2	52.0	49.7	49.2	48.8	53.5	0.0	53.5
	9	54.1	63.9	47.4	63.3	62.5	60.2	58.3	53.5	51.3	48.6	48.2	47.6	54.1	0.0	54.1
	10	57.3	69.9	48.2	69.5	68.5	64.0	59.7	54.4	52.1	49.3	48.8	48.4	57.3	0.0	57.3
	11	56.0	65.4	49.2	65.0	64.4	62.4	60.5	55.1	52.9	50.2	49.8	49.3	56.0	0.0	56.0
	12	54.5	63.2	48.1	62.6	62.0	60.0	58.4	54.7	52.3	49.2	48.7	48.3	54.5	0.0	54.5
	13	56.2	65.5	49.6	64.8	64.1	62.0	60.2	56.1	53.6	50.5	50.1	49.7	56.2	0.0	56.2
	14	54.3	62.5	48.6	62.0	61.4	59.5	58.2	54.6	52.3	49.5	49.2	48.7	54.3	0.0	54.3
	15	55.4	65.4	49.3	64.9	63.8	60.8	58.6	54.8	52.8	50.4	49.9	49.5	55.4	0.0	55.4
	16	56.1	65.9	49.4	65.3	64.6	62.5	60.1	55.4	53.0	50.5	50.0	49.5	56.1	0.0	56.1
	17	54.3	63.1	48.2	62.4	61.6	59.5	58.2	54.5	51.9	49.3	48.8	48.3	54.3	0.0	54.3
	18	52.9	61.4	47.7	60.8	60.1	58.0	56.6	53.0	51.0	48.6	48.3	47.9	52.9	0.0	52.9
Evening	19	53.3	64.0	46.3	63.4	62.7	59.5	57.0	52.4	49.9	47.2	46.8	46.4	53.3	5.0	58.3
	20	51.1	58.8	45.6	58.2	57.5	55.9	54.7	51.6	49.2	46.9	46.2	45.7	51.1	5.0	56.1
	21	49.5	56.2	44.9	55.9	55.5	54.4	53.6	49.7	47.5	45.7	45.4	45.0	49.5	5.0	54.5
Night	22	49.3	54.9	45.3	54.5	54.0	53.1	52.3	50.1	48.1	46.1	45.8	45.5	49.3	10.0	59.3
	23	50.3	59.0	45.6	58.3	57.7	55.4	54.4	49.9	48.0	46.2	46.0	45.7	50.3	10.0	60.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	52.9	60.3	47.4	59.9	59.4	57.8	56.6	53.0	51.0	48.6	48.2	47.6
	Max	58.8	69.9	53.1	69.5	68.5	65.0	62.6	57.2	55.5	53.8	53.6	53.2
Energy Average		55.6	Average:		64.1	63.3	61.0	59.0	54.8	52.6	50.0	49.5	49.1
Evening	Min	49.5	56.2	44.9	55.9	55.5	54.4	53.6	49.7	47.5	45.7	45.4	45.0
	Max	53.3	64.0	46.3	63.4	62.7	59.5	57.0	52.4	49.9	47.2	46.8	46.4
Energy Average		51.6	Average:		59.1	58.5	56.6	55.1	51.3	48.9	46.6	46.1	45.7
Night	Min	46.6	51.8	43.8	51.6	51.3	50.5	49.6	46.8	45.5	44.3	44.1	43.9
	Max	56.1	72.5	54.9	72.2	71.7	70.5	69.9	65.8	61.4	56.7	56.1	55.2
Energy Average		52.0	Average:		59.5	59.0	57.5	56.5	53.0	50.9	48.5	48.2	47.9

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
54.1	55.0	52.0

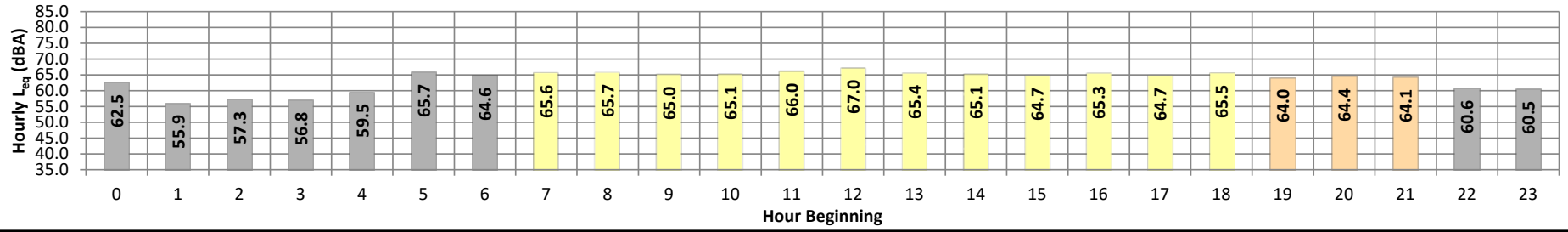
24-Hour CNEL (dBA)
59.2

24-Hour Noise Level Measurement Summary

Date: Wednesday, May 06, 2020 *Location:* L3 - Located south of the Project site on West Badillo Street near existing single-family residential home at 1108 Badillo Street. *Meter:* Piccolo II *JN:* 12965

Project: Covina Bowl *Analyst:* P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	62.5	76.6	43.4	75.8	74.3	70.4	67.3	55.4	49.1	44.3	43.9	43.6	62.5	10.0	72.5
	1	55.9	67.1	43.6	66.8	66.0	63.6	61.7	54.0	48.2	44.4	44.1	43.7	55.9	10.0	65.9
	2	57.3	67.6	46.5	67.3	66.5	64.2	62.1	56.7	52.9	48.4	47.6	46.6	57.3	10.0	67.3
	3	56.8	69.1	44.1	68.6	67.7	64.5	61.5	54.1	48.6	44.9	44.6	44.2	56.8	10.0	66.8
	4	59.5	70.8	48.3	70.5	69.6	66.8	64.5	57.5	52.9	49.3	48.9	48.5	59.5	10.0	69.5
	5	65.7	75.8	53.0	75.5	75.0	73.1	71.7	64.3	59.6	54.3	53.8	53.2	65.7	10.0	75.7
	6	64.6	74.6	52.1	74.2	73.4	71.4	70.2	64.6	58.9	53.0	52.6	52.2	64.6	10.0	74.6
Day	7	65.6	75.3	53.5	75.0	74.4	72.2	70.6	65.4	60.8	55.1	54.3	53.7	65.6	0.0	65.6
	8	65.7	74.1	57.4	73.7	73.0	71.2	70.2	66.3	62.9	58.9	58.2	57.5	65.7	0.0	65.7
	9	65.0	73.8	54.8	73.4	72.7	71.1	69.8	65.9	61.3	56.1	55.6	55.0	65.0	0.0	65.0
	10	65.1	75.5	51.0	75.1	74.2	71.6	69.9	65.0	60.6	53.5	52.4	51.3	65.1	0.0	65.1
	11	66.0	77.8	50.1	77.4	76.3	72.7	70.1	65.0	60.7	52.5	51.3	50.2	66.0	0.0	66.0
	12	67.0	78.0	52.2	77.6	77.1	75.4	72.6	65.0	60.9	54.2	53.2	52.5	67.0	0.0	67.0
	13	65.4	76.0	48.8	75.7	75.1	72.2	69.7	65.2	60.4	51.3	50.0	49.0	65.4	0.0	65.4
	14	65.1	75.1	48.8	74.6	74.0	72.0	70.2	65.4	60.2	51.8	50.5	49.1	65.1	0.0	65.1
	15	64.7	76.6	48.7	75.3	73.7	70.7	68.9	64.9	60.4	51.4	50.0	48.9	64.7	0.0	64.7
	16	65.3	75.4	50.2	75.0	74.2	71.2	69.8	66.0	61.3	52.9	51.5	50.4	65.3	0.0	65.3
	17	64.7	73.4	49.8	73.1	72.4	70.7	69.4	65.6	61.6	52.7	50.9	50.0	64.7	0.0	64.7
	18	65.5	75.5	50.2	75.0	74.3	72.1	70.5	65.7	60.9	52.4	51.1	50.3	65.5	0.0	65.5
Evening	19	64.0	73.9	49.5	73.5	72.9	70.5	68.8	64.5	59.6	51.8	50.6	49.7	64.0	5.0	69.0
	20	64.4	75.1	48.2	74.6	73.9	71.6	69.9	63.9	58.2	49.5	48.7	48.3	64.4	5.0	69.4
	21	64.1	75.5	46.8	75.0	74.6	72.4	69.8	61.2	55.0	47.8	47.3	46.9	64.1	5.0	69.1
Night	22	60.6	71.1	47.1	70.8	70.1	67.8	65.9	60.2	54.8	48.3	47.7	47.2	60.6	10.0	70.6
	23	60.5	72.4	44.9	71.9	71.2	68.3	65.8	57.8	51.2	45.7	45.4	45.0	60.5	10.0	70.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	64.7	73.4	48.7	73.1	72.4	70.7	68.9	64.9	60.2	51.3	50.0	48.9
	Max	67.0	78.0	57.4	77.6	77.1	75.4	72.6	66.3	62.9	58.9	58.2	57.5
Energy Average		65.5	Average:		75.1	74.3	71.9	70.1	65.5	61.0	53.6	52.4	51.5
Evening	Min	64.0	73.9	46.8	73.5	72.9	70.5	68.8	61.2	55.0	47.8	47.3	46.9
	Max	64.4	75.5	49.5	75.0	74.6	72.4	69.9	64.5	59.6	51.8	50.6	49.7
Energy Average		64.2	Average:		74.4	73.8	71.5	69.5	63.2	57.6	49.7	48.9	48.3
Night	Min	55.9	67.1	43.4	66.8	66.0	63.6	61.5	54.0	48.2	44.3	43.9	43.6
	Max	65.7	76.6	53.0	75.8	75.0	73.1	71.7	64.6	59.6	54.3	53.8	53.2
Energy Average		61.6	Average:		71.2	70.4	67.8	65.6	58.3	52.9	48.1	47.6	47.1

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
64.2	65.2	61.6

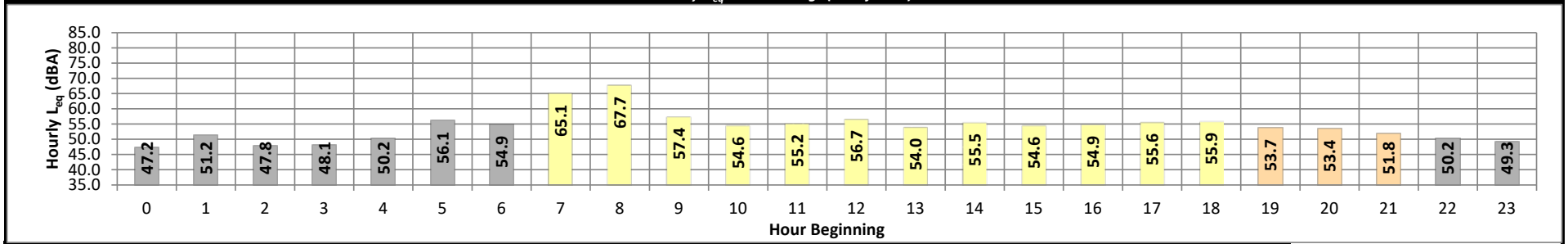
24-Hour CNEL (dBA)
69.1

24-Hour Noise Level Measurement Summary

Date: Wednesday, May 06, 2020 *Location:* L4 - Located by the western boundary of the Project site near the existing single-family residential home at 1119 West Badillo Street. *Meter:* Piccolo I *JN:* 12965

Project: Covina Bowl *Analyst:* P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	47.2	70.4	41.9	55.0	54.0	52.0	50.0	45.0	44.0	42.0	42.0	42.0	47.2	10.0	57.2
	1	51.2	67.9	42.3	64.0	62.0	56.0	53.0	46.0	44.0	42.0	42.0	42.0	51.2	10.0	61.2
	2	47.8	66.4	41.2	58.0	54.0	51.0	49.0	46.0	45.0	43.0	42.0	41.0	47.8	10.0	57.8
	3	48.1	72.2	41.0	57.0	55.0	52.0	50.0	46.0	44.0	43.0	42.0	41.0	48.1	10.0	58.1
	4	50.2	65.3	44.3	58.0	57.0	55.0	53.0	50.0	47.0	45.0	45.0	44.0	50.2	10.0	60.2
	5	56.1	74.6	47.9	65.0	63.0	60.0	58.0	55.0	53.0	50.0	49.0	48.0	56.1	10.0	66.1
	6	54.9	67.8	48.7	62.0	60.0	58.0	57.0	55.0	53.0	51.0	50.0	49.0	54.9	10.0	64.9
Day	7	65.1	83.6	46.2	77.0	75.0	71.0	69.0	62.0	56.0	51.0	49.0	47.0	65.1	0.0	65.1
	8	67.7	90.4	43.6	74.0	73.0	71.0	71.0	67.0	61.0	51.0	49.0	45.0	67.7	0.0	67.7
	9	57.4	69.4	41.2	63.0	62.0	61.0	60.0	59.0	56.0	48.0	46.0	44.0	57.4	0.0	57.4
	10	54.6	75.3	41.5	62.0	60.0	58.0	57.0	54.0	52.0	47.0	45.0	44.0	54.6	0.0	54.6
	11	55.2	74.2	42.4	64.0	61.0	58.0	57.0	55.0	52.0	46.0	45.0	43.0	55.2	0.0	55.2
	12	56.7	80.1	42.3	65.0	61.0	59.0	58.0	56.0	53.0	47.0	46.0	44.0	56.7	0.0	56.7
	13	54.0	75.4	43.3	62.0	60.0	58.0	57.0	54.0	51.0	45.0	45.0	44.0	54.0	0.0	54.0
	14	55.5	79.7	42.2	63.0	61.0	58.0	57.0	54.0	51.0	45.0	44.0	42.0	55.5	0.0	55.5
	15	54.6	77.3	42.5	63.0	60.0	58.0	57.0	54.0	51.0	46.0	45.0	43.0	54.6	0.0	54.6
	16	54.9	71.8	43.4	63.0	61.0	59.0	58.0	55.0	52.0	46.0	45.0	44.0	54.9	0.0	54.9
	17	55.6	75.4	43.1	64.0	62.0	59.0	58.0	55.0	52.0	46.0	45.0	44.0	55.6	0.0	55.6
	18	55.9	77.9	43.5	64.0	61.0	59.0	58.0	55.0	52.0	46.0	45.0	44.0	55.9	0.0	55.9
Evening	19	53.7	68.6	43.2	63.0	61.0	58.0	57.0	54.0	50.0	45.0	44.0	44.0	53.7	5.0	58.7
	20	53.4	76.3	42.4	62.0	60.0	58.0	56.0	53.0	48.0	44.0	43.0	42.0	53.4	5.0	58.4
	21	51.8	74.1	42.3	59.0	57.0	55.0	54.0	51.0	48.0	44.0	44.0	43.0	51.8	5.0	56.8
Night	22	50.2	69.9	42.3	58.0	56.0	54.0	53.0	49.0	46.0	44.0	43.0	42.0	50.2	10.0	60.2
	23	49.3	69.0	43.0	58.0	56.0	53.0	52.0	48.0	46.0	45.0	44.0	43.0	49.3	10.0	59.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	54.0	69.4	41.2	62.0	60.0	58.0	57.0	54.0	51.0	45.0	44.0	42.0
	Max	67.7	90.4	46.2	77.0	75.0	71.0	71.0	67.0	61.0	51.0	49.0	47.0
Energy Average		60.3	Average:		65.3	63.1	60.8	59.8	56.7	53.3	47.0	45.8	44.0
Evening	Min	51.8	68.6	42.3	59.0	57.0	55.0	54.0	51.0	48.0	44.0	43.0	42.0
	Max	53.7	76.3	43.2	63.0	61.0	58.0	57.0	54.0	50.0	45.0	44.0	44.0
Energy Average		53.0	Average:		61.3	59.3	57.0	55.7	52.7	48.7	44.3	43.7	43.0
Night	Min	47.2	65.3	41.0	55.0	54.0	51.0	49.0	45.0	44.0	42.0	42.0	41.0
	Max	56.1	74.6	48.7	65.0	63.0	60.0	58.0	55.0	53.0	51.0	50.0	49.0
Energy Average		51.7	Average:		59.4	57.4	54.6	52.8	48.9	46.9	45.0	44.3	43.6

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
57.9	59.5	51.7

24-Hour CNEL (dBA)
60.6

24-Hour Noise Level Measurement Summary

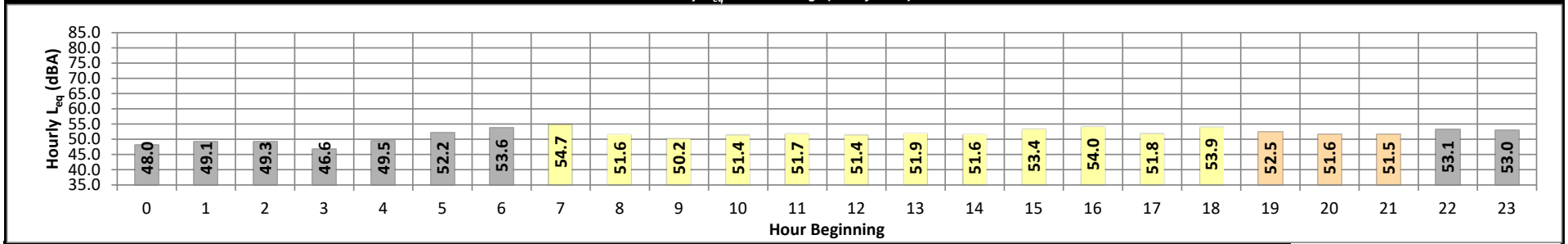
Date: Wednesday, May 06, 2020
Project: Covina Bowl

Location: L5 - Located northwest of the Project site by the Covina Bonita Apartments at 1130 West San Bernardino Road.

Meter: Piccolo I

JN: 12965
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	48.0	62.3	42.7	55.0	53.0	50.0	49.0	47.0	47.0	46.0	46.0	44.0	48.0	10.0	58.0
	1	49.1	70.0	40.3	60.0	56.0	52.0	50.0	47.0	46.0	41.0	40.0	40.0	49.1	10.0	59.1
	2	49.3	72.0	40.2	60.0	54.0	49.0	46.0	43.0	42.0	41.0	40.0	40.0	49.3	10.0	59.3
	3	46.6	68.6	40.7	56.0	54.0	51.0	50.0	45.0	43.0	42.0	41.0	41.0	46.6	10.0	56.6
	4	49.5	69.2	42.0	58.0	56.0	53.0	51.0	48.0	47.0	45.0	43.0	42.0	49.5	10.0	59.5
	5	52.2	71.0	45.0	61.0	59.0	56.0	54.0	51.0	49.0	47.0	46.0	46.0	52.2	10.0	62.2
	6	53.6	71.6	43.7	63.0	61.0	58.0	57.0	53.0	50.0	46.0	45.0	44.0	53.6	10.0	63.6
Day	7	54.7	77.6	44.2	63.0	60.0	58.0	57.0	54.0	50.0	46.0	46.0	45.0	54.7	0.0	54.7
	8	51.6	73.2	40.7	60.0	58.0	56.0	55.0	51.0	48.0	43.0	43.0	41.0	51.6	0.0	51.6
	9	50.2	68.5	40.4	58.0	56.0	54.0	53.0	50.0	47.0	43.0	42.0	41.0	50.2	0.0	50.2
	10	51.4	71.3	41.3	60.0	58.0	55.0	54.0	51.0	48.0	44.0	43.0	42.0	51.4	0.0	51.4
	11	51.7	71.7	42.7	61.0	59.0	56.0	54.0	51.0	49.0	45.0	44.0	43.0	51.7	0.0	51.7
	12	51.4	68.3	42.8	60.0	58.0	55.0	54.0	51.0	49.0	45.0	44.0	43.0	51.4	0.0	51.4
	13	51.9	73.7	43.2	60.0	58.0	55.0	54.0	51.0	49.0	45.0	45.0	43.0	51.9	0.0	51.9
	14	51.6	72.6	43.2	60.0	59.0	55.0	54.0	51.0	49.0	45.0	44.0	43.0	51.6	0.0	51.6
	15	53.4	81.0	43.2	62.0	59.0	56.0	54.0	51.0	49.0	45.0	44.0	43.0	53.4	0.0	53.4
	16	54.0	74.8	43.4	62.0	61.0	60.0	57.0	53.0	50.0	46.0	46.0	45.0	54.0	0.0	54.0
	17	51.8	72.8	43.3	61.0	59.0	56.0	54.0	51.0	49.0	45.0	44.0	44.0	51.8	0.0	51.8
	18	53.9	74.2	43.9	66.0	65.0	57.0	55.0	51.0	49.0	46.0	45.0	44.0	53.9	0.0	53.9
Evening	19	52.5	68.1	44.4	60.0	58.0	56.0	55.0	53.0	50.0	46.0	46.0	45.0	52.5	5.0	57.5
	20	51.6	67.7	43.6	60.0	59.0	56.0	55.0	51.0	48.0	45.0	44.0	44.0	51.6	5.0	56.6
	21	51.5	66.3	44.9	58.0	57.0	55.0	54.0	51.0	50.0	46.0	46.0	45.0	51.5	5.0	56.5
Night	22	53.1	69.8	45.8	61.0	59.0	56.0	55.0	53.0	51.0	49.0	49.0	46.0	53.1	10.0	63.1
	23	53.0	67.5	47.0	59.0	57.0	55.0	54.0	53.0	52.0	51.0	51.0	50.0	53.0	10.0	63.0

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	50.2	68.3	40.4	58.0	56.0	54.0	53.0	50.0	47.0	43.0	42.0	41.0
	Max	54.7	81.0	44.2	66.0	65.0	60.0	57.0	54.0	50.0	46.0	46.0	45.0
Energy Average		52.5	Average:		61.1	59.2	56.1	54.6	51.3	48.8	44.8	44.2	43.1
Evening	Min	51.5	66.3	43.6	58.0	57.0	55.0	54.0	51.0	48.0	45.0	44.0	44.0
	Max	52.5	68.1	44.9	60.0	59.0	56.0	55.0	53.0	50.0	46.0	46.0	45.0
Energy Average		51.9	Average:		59.3	58.0	55.7	54.7	51.7	49.3	45.7	45.3	44.7
Night	Min	46.6	62.3	40.2	55.0	53.0	49.0	46.0	43.0	42.0	41.0	40.0	40.0
	Max	53.6	72.0	47.0	63.0	61.0	58.0	57.0	53.0	52.0	51.0	51.0	50.0
Energy Average		51.1	Average:		59.2	56.6	53.3	51.8	48.9	47.4	45.3	44.6	43.7

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
52.0	52.4	51.1

24-Hour CNEL (dBA)

58.0

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CONTOURS

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Lark Ellen Av.
Road Segment: n/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,320 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,332 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.19	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-17.43	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.39	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.1	65.2	63.5	57.4	66.0	66.6
Medium Trucks:	61.2	59.6	53.3	51.7	60.2	60.4
Heavy Trucks:	62.5	61.0	52.0	53.3	61.6	61.7
Vehicle Noise:	69.2	67.4	64.1	59.6	68.1	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	65	140	301
CNEL:	32	69	149	322

Monday, June 22, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Lark Ellen Av.
Road Segment: s/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,600 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,160 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.79	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-18.03	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.99	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.5	64.6	62.9	56.8	65.4	66.0
Medium Trucks:	60.6	59.0	52.7	51.1	59.6	59.8
Heavy Trucks:	61.9	60.4	51.4	52.7	61.0	61.1
Vehicle Noise:	68.6	66.8	63.5	59.0	67.5	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	59	127	274
CNEL:	29	63	136	294

Monday, June 22, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Lark Ellen Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,540 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,454 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.19	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-17.05	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.01	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.5	65.6	63.9	57.8	66.4	67.0
Medium Trucks:	61.5	60.0	53.7	52.1	60.6	60.8
Heavy Trucks:	62.9	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	69.5	67.8	64.5	60.0	68.5	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	32	69	148	319
CNEL:	34	74	158	341

Monday, June 22, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Lark Ellen Av.
Road Segment: n/o Puente Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,580	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,758	vehicles
Vehicle Speed:	40	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:	40.0	feet
Centerline Dist. to Observer:	40.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.01	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.23	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.18	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.3	66.4	64.7	58.6	67.2	67.9
Medium Trucks:	62.4	60.8	54.5	52.9	61.4	61.6
Heavy Trucks:	63.7	62.3	53.2	54.5	62.8	62.9
Vehicle Noise:	70.4	68.6	65.4	60.8	69.3	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	78	168	362
CNEL:	39	83	180	387

Monday, June 22, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Rimsdale Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,310 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	231 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-7.80	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-25.04	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-29.00	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.5	57.6	55.9	49.8	58.4	59.0
Medium Trucks:	53.5	52.0	45.7	44.1	52.6	52.8
Heavy Trucks:	54.9	53.4	44.4	45.7	54.0	54.1
Vehicle Noise:	61.6	59.8	56.5	52.0	60.5	61.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	9	20	43	94
CNEL:	10	22	46	100

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Azusa Av.
Road Segment: n/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,850 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,885 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.31	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.92	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.88	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:	66.9	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	60.9	59.4	53.1	51.5	60.0	60.2
Heavy Trucks:	62.2	60.8	51.8	53.0	61.4	61.5
Vehicle Noise:	69.0	67.2	63.9	59.4	67.9	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	78	169	364
CNEL:	39	84	181	390

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Azusa Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,410 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,841 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.21	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-16.03	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.98	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:	66.8	64.9	63.2	57.1	65.7	66.3
Medium Trucks:	60.8	59.3	53.0	51.4	59.9	60.1
Heavy Trucks:	62.1	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	68.8	67.1	63.8	59.3	67.8	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	77	166	358
CNEL:	38	83	178	384

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Azusa Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,180 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,018 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.61	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.63	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.58	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:	67.2	65.3	63.6	57.5	66.1	66.7
Medium Trucks:	61.2	59.7	53.4	51.8	60.3	60.5
Heavy Trucks:	62.5	61.1	52.1	53.3	61.7	61.8
Vehicle Noise:	69.2	67.5	64.2	59.7	68.2	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	82	177	381
CNEL:	41	88	189	408

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Azusa Av.
Road Segment: s/o Puente Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,220 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,322 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	2.22	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.02	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.98	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:	67.8	65.9	64.2	58.1	66.7	67.4
Medium Trucks:	61.8	60.3	54.0	52.4	60.9	61.1
Heavy Trucks:	63.2	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	69.9	68.1	64.8	60.3	68.8	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	42	90	194	418
CNEL:	45	96	208	448

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Hollenbeck Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,930 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,193 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-0.09	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.33	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.29	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.0	63.1	61.4	55.3	63.9	64.5
Medium Trucks:	59.3	57.8	51.4	49.9	58.3	58.6
Heavy Trucks:	61.1	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	67.3	65.6	62.1	57.7	66.3	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	49	105	225
CNEL:	24	52	112	241

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Hollenbeck Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,820 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,082 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-0.52	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.76	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.71	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.6	62.7	60.9	54.9	63.5	64.1
Medium Trucks:	58.9	57.4	51.0	49.4	57.9	58.1
Heavy Trucks:	60.7	59.3	50.3	51.5	59.9	60.0
Vehicle Noise:	66.8	65.1	61.7	57.3	65.8	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	21	45	98	211
CNEL:	23	49	105	225

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: San Bernardino Rd.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,160	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,516	vehicles
Vehicle Speed:	40	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:	40.0	feet
Centerline Dist. to Observer:	40.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.37	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.87	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.83	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.7	65.8	64.0	58.0	66.6	67.2
Medium Trucks:	61.7	60.2	53.8	52.3	60.8	61.0
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	69.7	68.0	64.7	60.2	68.7	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	71	152	328
CNEL:	35	76	163	351

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: San Bernardino Rd.
Road Segment: e/o Rimsdale Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,610 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,561 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.07	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-16.16	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-20.12	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.5	65.1	65.7
Medium Trucks:	60.5	58.9	52.6	51.0	59.5	59.7
Heavy Trucks:	62.3	60.9	51.9	53.1	61.5	61.6
Vehicle Noise:	68.4	66.7	63.3	58.9	67.4	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	58	125	269
CNEL:	29	62	134	288

Monday, June 22, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: San Bernardino Rd.
Road Segment: e/o Hollenbeck Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,700	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,170	vehicles
Vehicle Speed:	30	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:	40.0	feet
Centerline Dist. to Observer:	40.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	0.49	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	73.48	-16.75	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-20.70	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.1	61.2	59.4	53.3	62.0	62.6
Medium Trucks:	57.6	56.1	49.7	48.2	56.6	56.9
Heavy Trucks:	60.1	58.7	49.6	50.9	59.2	59.4
Vehicle Noise:	65.6	63.9	60.2	56.1	64.6	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	17	38	81	174
CNEL:	19	40	86	186

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Badillo St.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,380 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,638 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	0.19	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-17.05	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-21.00	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:	67.8	65.9	64.1	58.0	66.7	67.3
Medium Trucks:	61.5	60.0	53.7	52.1	60.6	60.8
Heavy Trucks:	62.4	61.0	51.9	53.2	61.5	61.7
Vehicle Noise:	69.6	67.9	64.7	60.0	68.6	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	87	187	402
CNEL:	43	93	200	431

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Badillo St.
Road Segment: w/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,410	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,741	vehicles
Vehicle Speed:	40	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	0.97	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-16.27	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.23	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:	66.6	64.7	62.9	56.9	65.5	66.1
Medium Trucks:	60.6	59.1	52.7	51.2	59.6	59.9
Heavy Trucks:	61.9	60.5	51.4	52.7	61.1	61.2
Vehicle Noise:	68.6	66.9	63.6	59.1	67.6	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	74	160	345
CNEL:	37	80	172	370

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Badillo St.
Road Segment: e/o Armel Dr.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,560 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,656 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	0.75	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-16.49	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.44	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:	66.4	64.5	62.7	56.7	65.3	65.9
Medium Trucks:	60.4	58.9	52.5	51.0	59.4	59.6
Heavy Trucks:	61.7	60.3	51.2	52.5	60.8	61.0
Vehicle Noise:	68.4	66.7	63.4	58.8	67.4	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	72	155	334
CNEL:	36	77	166	357

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Puente Av.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,450 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,045 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	-1.25	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-18.49	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.44	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:	64.4	62.5	60.7	54.7	63.3	63.9
Medium Trucks:	58.4	56.9	50.5	49.0	57.4	57.6
Heavy Trucks:	59.7	58.3	49.2	50.5	58.8	59.0
Vehicle Noise:	66.4	64.7	61.4	56.8	65.4	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	25	53	114	246
CNEL:	26	57	122	263

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Puente Av.
Road Segment: e/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,580 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,158 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-0.22	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.46	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.42	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.9	63.0	61.2	55.2	63.8	64.4
Medium Trucks:	59.2	57.6	51.3	49.7	58.2	58.4
Heavy Trucks:	61.0	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	67.1	65.4	62.0	57.6	66.1	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	22	48	102	221
CNEL:	24	51	109	236

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Lark Ellen Av.
Road Segment: n/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,450 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,345 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.15	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-17.39	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.35	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.2	65.3	63.5	57.5	66.1	66.7
Medium Trucks:	61.2	59.7	53.3	51.8	60.2	60.5
Heavy Trucks:	62.5	61.1	52.1	53.3	61.7	61.8
Vehicle Noise:	69.2	67.5	64.2	59.6	68.2	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	65	140	303
CNEL:	32	70	150	324

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Lark Ellen Av.
Road Segment: s/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,660 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,166 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.77	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-18.01	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.97	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.6	64.7	62.9	56.8	65.5	66.1
Medium Trucks:	60.6	59.1	52.7	51.2	59.6	59.9
Heavy Trucks:	61.9	60.5	51.4	52.7	61.0	61.2
Vehicle Noise:	68.6	66.9	63.6	59.0	67.6	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	28	59	128	275
CNEL:	29	63	137	295

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Lark Ellen Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,670 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,467 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.22	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-17.01	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.97	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.6	65.7	63.9	57.8	66.5	67.1
Medium Trucks:	61.6	60.1	53.7	52.2	60.6	60.8
Heavy Trucks:	62.9	61.5	52.4	53.7	62.0	62.2
Vehicle Noise:	69.6	67.9	64.6	60.0	68.6	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	32	69	149	321
CNEL:	34	74	159	343

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Lark Ellen Av.
Road Segment: n/o Puente Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,640	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,764	vehicles
Vehicle Speed:	40	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:	40.0	feet
Centerline Dist. to Observer:	40.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.03	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.21	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.17	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.4	66.5	64.7	58.6	67.3	67.9
Medium Trucks:	62.4	60.9	54.5	53.0	61.4	61.7
Heavy Trucks:	63.7	62.3	53.2	54.5	62.8	63.0
Vehicle Noise:	70.4	68.7	65.4	60.8	69.4	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	78	168	363
CNEL:	39	84	180	388

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Rimsdale Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,310 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	231 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-7.80	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-25.04	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-29.00	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.5	57.6	55.9	49.8	58.4	59.0
Medium Trucks:	53.5	52.0	45.7	44.1	52.6	52.8
Heavy Trucks:	54.9	53.4	44.4	45.7	54.0	54.1
Vehicle Noise:	61.6	59.8	56.5	52.0	60.5	61.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	9	20	43	94
CNEL:	10	22	46	100

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Azusa Av.
Road Segment: n/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,010 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,901 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.35	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.89	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.84	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:	67.0	65.1	63.3	57.3	65.9	66.5
Medium Trucks:	61.0	59.5	53.1	51.6	60.0	60.2
Heavy Trucks:	62.3	60.9	51.8	53.1	61.4	61.6
Vehicle Noise:	69.0	67.3	64.0	59.4	68.0	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	79	170	366
CNEL:	39	84	182	392

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Azusa Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,410	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,841	vehicles
Vehicle Speed:	40	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.21	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-16.03	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.98	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:	66.8	64.9	63.2	57.1	65.7	66.3
Medium Trucks:	60.8	59.3	53.0	51.4	59.9	60.1
Heavy Trucks:	62.1	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	68.8	67.1	63.8	59.3	67.8	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	77	166	358
CNEL:	38	83	178	384

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Azusa Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,180 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,018 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.61	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.63	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.58	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:	67.2	65.3	63.6	57.5	66.1	66.7
Medium Trucks:	61.2	59.7	53.4	51.8	60.3	60.5
Heavy Trucks:	62.5	61.1	52.1	53.3	61.7	61.8
Vehicle Noise:	69.2	67.5	64.2	59.7	68.2	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	82	177	381
CNEL:	41	88	189	408

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Azusa Av.
Road Segment: s/o Puente Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,380 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,338 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	2.25	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-14.99	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.95	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:	67.9	66.0	64.2	58.2	66.8	67.4
Medium Trucks:	61.9	60.4	54.0	52.4	60.9	61.1
Heavy Trucks:	63.2	61.8	52.7	54.0	62.3	62.5
Vehicle Noise:	69.9	68.2	64.9	60.3	68.9	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	42	91	195	420
CNEL:	45	97	209	450

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Hollenbeck Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,930	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,193	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	40.0	feet
Centerline Dist. to Observer:	40.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-0.09	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.33	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.29	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.0	63.1	61.4	55.3	63.9	64.5
Medium Trucks:	59.3	57.8	51.4	49.9	58.3	58.6
Heavy Trucks:	61.1	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	67.3	65.6	62.1	57.7	66.3	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	49	105	225
CNEL:	24	52	112	241

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Hollenbeck Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,820 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,082 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-0.52	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.76	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.71	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.6	62.7	60.9	54.9	63.5	64.1
Medium Trucks:	58.9	57.4	51.0	49.4	57.9	58.1
Heavy Trucks:	60.7	59.3	50.3	51.5	59.9	60.0
Vehicle Noise:	66.8	65.1	61.7	57.3	65.8	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	21	45	98	211
CNEL:	23	49	105	225

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: San Bernardino Rd.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,440 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,544 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.45	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.79	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.75	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.8	65.9	64.1	58.1	66.7	67.3
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.1
Heavy Trucks:	63.1	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	69.8	68.1	64.8	60.2	68.8	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	71	154	332
CNEL:	36	77	165	355

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: San Bernardino Rd.
Road Segment: e/o Rimsdale Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,700 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,570 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.10	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-16.14	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-20.09	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.6	56.5	65.1	65.7
Medium Trucks:	60.5	59.0	52.6	51.1	59.5	59.8
Heavy Trucks:	62.3	60.9	51.9	53.1	61.5	61.6
Vehicle Noise:	68.5	66.8	63.3	58.9	67.5	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	58	126	270
CNEL:	29	62	134	289

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: San Bernardino Rd.
Road Segment: e/o Hollenbeck Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,830 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,183 vehicles
Vehicle Speed:	30 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	0.54	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	73.48	-16.70	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-20.65	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.1	61.2	59.5	53.4	62.0	62.6
Medium Trucks:	57.6	56.1	49.8	48.2	56.7	56.9
Heavy Trucks:	60.1	58.7	49.7	50.9	59.3	59.4
Vehicle Noise:	65.6	63.9	60.3	56.1	64.6	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	18	38	81	175
CNEL:	19	40	87	187

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Badillo St.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,520 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,652 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	0.23	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-17.01	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.97	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:	67.8	65.9	64.1	58.1	66.7	67.3
Medium Trucks:	61.6	60.1	53.7	52.2	60.6	60.9
Heavy Trucks:	62.4	61.0	52.0	53.2	61.6	61.7
Vehicle Noise:	69.6	67.9	64.7	60.1	68.6	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	87	188	404
CNEL:	43	93	201	434

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Badillo St.
Road Segment: w/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,540 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,754 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.00	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-16.24	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.19	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:	66.6	64.7	63.0	56.9	65.5	66.1
Medium Trucks:	60.6	59.1	52.7	51.2	59.7	59.9
Heavy Trucks:	61.9	60.5	51.5	52.7	61.1	61.2
Vehicle Noise:	68.6	66.9	63.6	59.1	67.6	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	75	161	347
CNEL:	37	80	172	371

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Badillo St.
Road Segment: e/o Armel Dr.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,690 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,669 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	0.79	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-16.45	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.41	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:	66.4	64.5	62.7	56.7	65.3	65.9
Medium Trucks:	60.4	58.9	52.5	51.0	59.4	59.7
Heavy Trucks:	61.7	60.3	51.3	52.5	60.9	61.0
Vehicle Noise:	68.4	66.7	63.4	58.9	67.4	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	34	72	156	336
CNEL:	36	77	167	359

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Puente Av.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,450	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,045	vehicles
Vehicle Speed:	40	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	-1.25	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-18.49	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.44	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:	64.4	62.5	60.7	54.7	63.3	63.9
Medium Trucks:	58.4	56.9	50.5	49.0	57.4	57.6
Heavy Trucks:	59.7	58.3	49.2	50.5	58.8	59.0
Vehicle Noise:	66.4	64.7	61.4	56.8	65.4	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	25	53	114	246
CNEL:	26	57	122	263

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Puente Av.
Road Segment: e/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,580	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,158	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	40.0	feet
Centerline Dist. to Observer:	40.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-0.22	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.46	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.42	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.9	63.0	61.2	55.2	63.8	64.4
Medium Trucks:	59.2	57.6	51.3	49.7	58.2	58.4
Heavy Trucks:	61.0	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	67.1	65.4	62.0	57.6	66.1	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	22	48	102	221
CNEL:	24	51	109	236

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Lark Ellen Av.
Road Segment: n/o Cypress St.
Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,050 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,405 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.04	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-17.20	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.16	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.4	65.5	63.7	57.7	66.3	66.9
Medium Trucks:	61.4	59.9	53.5	52.0	60.4	60.7
Heavy Trucks:	62.7	61.3	52.2	53.5	61.8	62.0
Vehicle Noise:	69.4	67.7	64.4	59.8	68.4	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	31	67	145	312
CNEL:	33	72	155	334

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Lark Ellen Av.
Road Segment: s/o Cypress St.
Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,310 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,231 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.54	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-17.78	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.73	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.8	64.9	63.1	57.1	65.7	66.3
Medium Trucks:	60.8	59.3	52.9	51.4	59.9	60.1
Heavy Trucks:	62.1	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	68.8	67.1	63.8	59.3	67.8	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	61	132	285
CNEL:	31	66	142	305

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Lark Ellen Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,330 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,533 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.42	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.82	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.78	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.8	65.9	64.1	58.0	66.7	67.3
Medium Trucks:	61.8	60.3	53.9	52.3	60.8	61.0
Heavy Trucks:	63.1	61.7	52.6	53.9	62.2	62.4
Vehicle Noise:	69.8	68.0	64.8	60.2	68.8	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	71	153	330
CNEL:	35	76	164	354

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Lark Ellen Av.
Road Segment: n/o Puente Av.
Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,590	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,859	vehicles
Vehicle Speed:	40	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:	40.0	feet
Centerline Dist. to Observer:	40.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.25	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-15.99	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.94	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	66.7	64.9	58.9	67.5	68.1
Medium Trucks:	62.6	61.1	54.7	53.2	61.6	61.9
Heavy Trucks:	63.9	62.5	53.5	54.7	63.1	63.2
Vehicle Noise:	70.6	68.9	65.6	61.1	69.6	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	81	174	376
CNEL:	40	87	187	402

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Rimsdale Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,430 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	243 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-7.58	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-24.82	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-28.78	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.8	57.9	56.1	50.0	58.7	59.3
Medium Trucks:	53.8	52.3	45.9	44.3	52.8	53.0
Heavy Trucks:	55.1	53.7	44.6	45.9	54.2	54.4
Vehicle Noise:	61.8	60.0	56.8	52.2	60.8	61.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	10	21	45	97
CNEL:	10	22	48	104

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Azusa Av.
Road Segment: n/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,030 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,003 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.58	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.66	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.62	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:	67.2	65.3	63.5	57.5	66.1	66.7
Medium Trucks:	61.2	59.7	53.3	51.8	60.2	60.5
Heavy Trucks:	62.5	61.1	52.1	53.3	61.7	61.8
Vehicle Noise:	69.2	67.5	64.2	59.7	68.2	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	82	176	379
CNEL:	41	87	188	406

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Azusa Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,710	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,971	vehicles
Vehicle Speed:	40	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.51	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.73	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.69	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:	67.1	65.2	63.5	57.4	66.0	66.6
Medium Trucks:	61.1	59.6	53.3	51.7	60.2	60.4
Heavy Trucks:	62.4	61.0	52.0	53.2	61.6	61.7
Vehicle Noise:	69.1	67.4	64.1	59.6	68.1	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	81	174	375
CNEL:	40	86	186	401

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Azusa Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,560 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,156 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.90	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.34	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.30	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:	67.5	65.6	63.9	57.8	66.4	67.0
Medium Trucks:	61.5	60.0	53.6	52.1	60.6	60.8
Heavy Trucks:	62.8	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	69.5	67.8	64.5	60.0	68.5	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	86	185	398
CNEL:	43	92	198	426

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Azusa Av.
Road Segment: s/o Puente Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,800 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,480 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	2.51	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-14.73	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.69	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:	68.1	66.2	64.5	58.4	67.0	67.6
Medium Trucks:	62.1	60.6	54.3	52.7	61.2	61.4
Heavy Trucks:	63.4	62.0	53.0	54.2	62.6	62.7
Vehicle Noise:	70.1	68.4	65.1	60.6	69.1	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	94	203	437
CNEL:	47	101	217	468

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Hollenbeck Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,820 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,282 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.22	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.02	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-20.97	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.3	63.4	61.7	55.6	64.2	64.9
Medium Trucks:	59.6	58.1	51.7	50.2	58.6	58.9
Heavy Trucks:	61.5	60.0	51.0	52.2	60.6	60.7
Vehicle Noise:	67.6	65.9	62.4	58.0	66.6	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	51	110	236
CNEL:	25	54	117	252

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Hollenbeck Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,650	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,165	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	40.0	feet
Centerline Dist. to Observer:	40.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-0.20	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.43	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.39	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.9	63.0	61.3	55.2	63.8	64.4
Medium Trucks:	59.2	57.7	51.3	49.8	58.2	58.5
Heavy Trucks:	61.0	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	67.2	65.5	62.0	57.6	66.2	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	22	48	103	222
CNEL:	24	51	110	237

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: San Bernardino Rd.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,500 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,650 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.74	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.50	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.46	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.1	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	62.1	60.6	54.2	52.7	61.1	61.4
Heavy Trucks:	63.4	62.0	52.9	54.2	62.5	62.7
Vehicle Noise:	70.1	68.4	65.1	60.5	69.1	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	75	161	347
CNEL:	37	80	172	371

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: San Bernardino Rd.
Road Segment: e/o Rimsdale Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,940 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,694 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.43	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-15.81	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-19.76	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.6	64.7	62.9	56.8	65.5	66.1
Medium Trucks:	60.8	59.3	52.9	51.4	59.9	60.1
Heavy Trucks:	62.7	61.2	52.2	53.5	61.8	61.9
Vehicle Noise:	68.8	67.1	63.6	59.3	67.8	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	28	61	132	285
CNEL:	30	65	141	304

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: San Bernardino Rd.
Road Segment: e/o Hollenbeck Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,980	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,298	vehicles
Vehicle Speed:	30	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:	40.0	feet
Centerline Dist. to Observer:	40.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	0.94	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	73.48	-16.30	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-20.25	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.5	61.6	59.9	53.8	62.4	63.0
Medium Trucks:	58.1	56.5	50.2	48.6	57.1	57.3
Heavy Trucks:	60.5	59.1	50.1	51.3	59.7	59.8
Vehicle Noise:	66.0	64.3	60.7	56.5	65.0	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	19	40	87	187
CNEL:	20	43	92	199

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Badillo St.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,360 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,736 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	0.44	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.79	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.75	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:	68.0	66.1	64.4	58.3	66.9	67.5
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.1
Heavy Trucks:	62.6	61.2	52.2	53.4	61.8	61.9
Vehicle Noise:	69.9	68.1	65.0	60.3	68.8	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	42	90	194	418
CNEL:	45	97	208	448

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Badillo St.
Road Segment: w/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,460 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,846 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.22	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-16.02	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.97	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:	66.8	64.9	63.2	57.1	65.7	66.4
Medium Trucks:	60.8	59.3	53.0	51.4	59.9	60.1
Heavy Trucks:	62.2	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	68.9	67.1	63.8	59.3	67.8	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	77	167	359
CNEL:	38	83	178	384

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Badillo St.
Road Segment: e/o Armel Dr.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,400	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,740	vehicles
Vehicle Speed:	40	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	0.97	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-16.27	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.23	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:	66.6	64.7	62.9	56.9	65.5	66.1
Medium Trucks:	60.6	59.1	52.7	51.2	59.6	59.9
Heavy Trucks:	61.9	60.5	51.4	52.7	61.0	61.2
Vehicle Noise:	68.6	66.9	63.6	59.0	67.6	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	74	160	345
CNEL:	37	80	171	369

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Puente Av.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,190	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,119	vehicles
Vehicle Speed:	40	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	-0.95	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-18.19	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.15	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:	64.7	62.8	61.0	55.0	63.6	64.2
Medium Trucks:	58.7	57.2	50.8	49.2	57.7	57.9
Heavy Trucks:	60.0	58.6	49.5	50.8	59.1	59.3
Vehicle Noise:	66.7	65.0	61.7	57.1	65.7	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	26	55	119	257
CNEL:	28	59	128	275

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024
Road Name: Puente Av.
Road Segment: e/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,360 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,236 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.06	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.18	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.13	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.2	63.3	61.5	55.5	64.1	64.7
Medium Trucks:	59.4	57.9	51.6	50.0	58.5	58.7
Heavy Trucks:	61.3	59.9	50.8	52.1	60.4	60.6
Vehicle Noise:	67.4	65.7	62.3	57.9	66.4	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	50	107	231
CNEL:	25	53	114	246

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Lark Ellen Av.
Road Segment: n/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,180 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,418 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.08	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-17.16	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.12	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.4	65.5	63.7	57.7	66.3	66.9
Medium Trucks:	61.4	59.9	53.6	52.0	60.5	60.7
Heavy Trucks:	62.7	61.3	52.3	53.5	61.9	62.0
Vehicle Noise:	69.4	67.7	64.4	59.9	68.4	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	31	68	146	314
CNEL:	34	72	156	336

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Lark Ellen Av.
Road Segment: s/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,370 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,237 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.52	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-17.75	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.71	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.8	64.9	63.2	57.1	65.7	66.3
Medium Trucks:	60.8	59.3	53.0	51.4	59.9	60.1
Heavy Trucks:	62.1	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	68.8	67.1	63.8	59.3	67.8	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	62	133	286
CNEL:	31	66	142	306

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Lark Ellen Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,460 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,546 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.45	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.79	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.74	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.8	65.9	64.1	58.1	66.7	67.3
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.1
Heavy Trucks:	63.1	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	69.8	68.1	64.8	60.3	68.8	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	72	154	332
CNEL:	36	77	165	356

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Lark Ellen Av.
Road Segment: n/o Puente Av.
Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,650 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,865 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.27	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-15.97	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.93	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	66.7	64.9	58.9	67.5	68.1
Medium Trucks:	62.6	61.1	54.7	53.2	61.7	61.9
Heavy Trucks:	63.9	62.5	53.5	54.7	63.1	63.2
Vehicle Noise:	70.6	68.9	65.6	61.1	69.6	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	81	175	376
CNEL:	40	87	187	403

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Rimsdale Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,430 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	243 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-7.58	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-24.82	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-28.78	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.8	57.9	56.1	50.0	58.7	59.3
Medium Trucks:	53.8	52.3	45.9	44.3	52.8	53.0
Heavy Trucks:	55.1	53.7	44.6	45.9	54.2	54.4
Vehicle Noise:	61.8	60.0	56.8	52.2	60.8	61.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	10	21	45	97
CNEL:	10	22	48	104

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Azusa Av.
Road Segment: n/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,190	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,019	vehicles
Vehicle Speed:	40	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.61	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.63	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.58	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:	67.2	65.3	63.6	57.5	66.1	66.7
Medium Trucks:	61.2	59.7	53.4	51.8	60.3	60.5
Heavy Trucks:	62.5	61.1	52.1	53.3	61.7	61.8
Vehicle Noise:	69.3	67.5	64.2	59.7	68.2	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	82	177	381
CNEL:	41	88	189	408

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Azusa Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,710	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,971	vehicles
Vehicle Speed:	40	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.51	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.73	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.69	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:	67.1	65.2	63.5	57.4	66.0	66.6
Medium Trucks:	61.1	59.6	53.3	51.7	60.2	60.4
Heavy Trucks:	62.4	61.0	52.0	53.2	61.6	61.7
Vehicle Noise:	69.1	67.4	64.1	59.6	68.1	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	81	174	375
CNEL:	40	86	186	401

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Azusa Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,560 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,156 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.90	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.34	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.30	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:	67.5	65.6	63.9	57.8	66.4	67.0
Medium Trucks:	61.5	60.0	53.6	52.1	60.6	60.8
Heavy Trucks:	62.8	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	69.5	67.8	64.5	60.0	68.5	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	86	185	398
CNEL:	43	92	198	426

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Azusa Av.
Road Segment: s/o Puente Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,960 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,496 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	2.53	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-14.71	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.66	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:	68.2	66.3	64.5	58.4	67.1	67.7
Medium Trucks:	62.1	60.6	54.3	52.7	61.2	61.4
Heavy Trucks:	63.5	62.0	53.0	54.3	62.6	62.7
Vehicle Noise:	70.2	68.4	65.2	60.6	69.2	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	95	204	439
CNEL:	47	101	218	470

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Hollenbeck Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,820 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,282 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.22	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.02	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-20.97	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.3	63.4	61.7	55.6	64.2	64.9
Medium Trucks:	59.6	58.1	51.7	50.2	58.6	58.9
Heavy Trucks:	61.5	60.0	51.0	52.2	60.6	60.7
Vehicle Noise:	67.6	65.9	62.4	58.0	66.6	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	51	110	236
CNEL:	25	54	117	252

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Hollenbeck Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,650 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,165 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-0.20	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.43	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.39	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.9	63.0	61.3	55.2	63.8	64.4
Medium Trucks:	59.2	57.7	51.3	49.8	58.2	58.5
Heavy Trucks:	61.0	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	67.2	65.5	62.0	57.6	66.2	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	22	48	103	222
CNEL:	24	51	110	237

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: San Bernardino Rd.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,780 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,678 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.81	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.43	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.39	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.1	66.2	64.5	58.4	67.0	67.7
Medium Trucks:	62.2	60.6	54.3	52.7	61.2	61.4
Heavy Trucks:	63.5	62.1	53.0	54.3	62.6	62.7
Vehicle Noise:	70.2	68.4	65.1	60.6	69.1	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	76	163	351
CNEL:	38	81	174	376

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: San Bernardino Rd.
Road Segment: e/o Rimsdale Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,030	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,703	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	40.0	feet
Centerline Dist. to Observer:	40.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.45	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-15.79	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-19.74	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.6	64.7	62.9	56.9	65.5	66.1
Medium Trucks:	60.8	59.3	53.0	51.4	59.9	60.1
Heavy Trucks:	62.7	61.3	52.2	53.5	61.8	62.0
Vehicle Noise:	68.8	67.1	63.7	59.3	67.8	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	62	133	286
CNEL:	31	66	142	305

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: San Bernardino Rd.
Road Segment: e/o Hollenbeck Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,110 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,311 vehicles
Vehicle Speed:	30 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	0.99	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	73.48	-16.25	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-20.21	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.6	61.7	59.9	53.8	62.5	63.1
Medium Trucks:	58.1	56.6	50.2	48.7	57.1	57.4
Heavy Trucks:	60.6	59.2	50.1	51.4	59.7	59.9
Vehicle Noise:	66.1	64.4	60.7	56.6	65.1	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	19	40	87	188
CNEL:	20	43	93	200

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Badillo St.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,500 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,750 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	0.48	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.76	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.71	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:	68.1	66.2	64.4	58.3	67.0	67.6
Medium Trucks:	61.8	60.3	54.0	52.4	60.9	61.1
Heavy Trucks:	62.7	61.3	52.2	53.5	61.8	61.9
Vehicle Noise:	69.9	68.2	65.0	60.3	68.9	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	42	91	195	420
CNEL:	45	97	209	451

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Badillo St.
Road Segment: w/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,590 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,859 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.25	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.99	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.94	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:	66.9	65.0	63.2	57.2	65.8	66.4
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.1
Heavy Trucks:	62.2	60.8	51.7	53.0	61.3	61.5
Vehicle Noise:	68.9	67.2	63.9	59.3	67.9	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	78	167	361
CNEL:	39	83	179	386

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Badillo St.
Road Segment: e/o Armel Dr.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,530 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,753 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.00	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-16.24	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.20	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:	66.6	64.7	63.0	56.9	65.5	66.1
Medium Trucks:	60.6	59.1	52.7	51.2	59.7	59.9
Heavy Trucks:	61.9	60.5	51.5	52.7	61.1	61.2
Vehicle Noise:	68.6	66.9	63.6	59.1	67.6	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	75	161	347
CNEL:	37	80	172	371

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Puente Av.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,190 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,119 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	-0.95	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-18.19	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.15	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:	64.7	62.8	61.0	55.0	63.6	64.2
Medium Trucks:	58.7	57.2	50.8	49.2	57.7	57.9
Heavy Trucks:	60.0	58.6	49.5	50.8	59.1	59.3
Vehicle Noise:	66.7	65.0	61.7	57.1	65.7	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	26	55	119	257
CNEL:	28	59	128	275

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2024 + P
Road Name: Puente Av.
Road Segment: e/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,360 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,236 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.06	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.18	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.13	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.2	63.3	61.5	55.5	64.1	64.7
Medium Trucks:	59.4	57.9	51.6	50.0	58.5	58.7
Heavy Trucks:	61.3	59.9	50.8	52.1	60.4	60.6
Vehicle Noise:	67.4	65.7	62.3	57.9	66.4	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	50	107	231
CNEL:	25	53	114	246

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Lark Ellen Av.
Road Segment: n/o Cypress St.
Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,200 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,520 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.38	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.86	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.82	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.7	65.8	64.0	58.0	66.6	67.2
Medium Trucks:	61.7	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	69.7	68.0	64.7	60.2	68.7	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	71	152	328
CNEL:	35	76	163	352

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Lark Ellen Av.
Road Segment: s/o Cypress St.
Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,310 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,331 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.20	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-17.44	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.39	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.1	65.2	63.5	57.4	66.0	66.6
Medium Trucks:	61.1	59.6	53.3	51.7	60.2	60.4
Heavy Trucks:	62.5	61.0	52.0	53.3	61.6	61.7
Vehicle Noise:	69.2	67.4	64.1	59.6	68.1	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	65	140	301
CNEL:	32	69	149	322

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Lark Ellen Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,600 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,660 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.76	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.48	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.43	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.1	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	62.1	60.6	54.2	52.7	61.2	61.4
Heavy Trucks:	63.4	62.0	53.0	54.2	62.6	62.7
Vehicle Noise:	70.1	68.4	65.1	60.6	69.1	69.5

Centerline Distance to Noise Contour (in feet)

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

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Lark Ellen Av.
Road Segment: n/o Puente Av.
Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,130 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,013 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.60	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-15.64	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.60	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.9	67.0	65.3	59.2	67.8	68.4
Medium Trucks:	62.9	61.4	55.1	53.5	62.0	62.2
Heavy Trucks:	64.3	62.8	53.8	55.1	63.4	63.5
Vehicle Noise:	71.0	69.2	65.9	61.4	69.9	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	85	184	396
CNEL:	42	91	197	424

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Rimsdale Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,620 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	262 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-7.26	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-24.49	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-28.45	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.1	58.2	56.4	50.4	59.0	59.6
Medium Trucks:	54.1	52.6	46.2	44.7	53.1	53.4
Heavy Trucks:	55.4	54.0	45.0	46.2	54.6	54.7
Vehicle Noise:	62.1	60.4	57.1	52.5	61.1	61.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	10	22	47	102
CNEL:	11	23	51	109

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Azusa Av.
Road Segment: n/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,670 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,167 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.92	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.32	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.28	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:	67.5	65.6	63.9	57.8	66.4	67.1
Medium Trucks:	61.5	60.0	53.7	52.1	60.6	60.8
Heavy Trucks:	62.9	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	69.6	67.8	64.5	60.0	68.5	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	86	185	399
CNEL:	43	92	198	428

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Azusa Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,320 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,132 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.85	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.39	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.35	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:	67.5	65.6	63.8	57.8	66.4	67.0
Medium Trucks:	61.5	60.0	53.6	52.0	60.5	60.7
Heavy Trucks:	62.8	61.4	52.3	53.6	61.9	62.1
Vehicle Noise:	69.5	67.8	64.5	59.9	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	85	183	395
CNEL:	42	91	196	423

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Azusa Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,320 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,332 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	2.24	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.00	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.96	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:	67.9	66.0	64.2	58.1	66.8	67.4
Medium Trucks:	61.9	60.3	54.0	52.4	60.9	61.1
Heavy Trucks:	63.2	61.8	52.7	54.0	62.3	62.4
Vehicle Noise:	69.9	68.1	64.9	60.3	68.9	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	42	90	195	419
CNEL:	45	97	208	449

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Azusa Av.
Road Segment: s/o Puente Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,830 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,683 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	2.85	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-14.39	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.35	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:	68.5	66.6	64.8	58.8	67.4	68.0
Medium Trucks:	62.5	61.0	54.6	53.0	61.5	61.7
Heavy Trucks:	63.8	62.4	53.3	54.6	62.9	63.1
Vehicle Noise:	70.5	68.8	65.5	60.9	69.5	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	46	99	214	460
CNEL:	49	106	229	493

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Hollenbeck Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,860 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,386 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.56	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-16.68	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-20.64	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.7	63.8	62.0	56.0	64.6	65.2
Medium Trucks:	59.9	58.4	52.1	50.5	59.0	59.2
Heavy Trucks:	61.8	60.4	51.3	52.6	60.9	61.1
Vehicle Noise:	67.9	66.2	62.8	58.4	66.9	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	25	54	116	249
CNEL:	27	57	123	266

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Hollenbeck Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,590 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,259 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.14	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.10	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.05	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.3	63.4	61.6	55.5	64.2	64.8
Medium Trucks:	59.5	58.0	51.7	50.1	58.6	58.8
Heavy Trucks:	61.4	60.0	50.9	52.2	60.5	60.7
Vehicle Noise:	67.5	65.8	62.3	58.0	66.5	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	50	108	233
CNEL:	25	54	116	249

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: San Bernardino Rd.
Road Segment: w/o Lark Ellen Av.
Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,820	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,782	vehicles
Vehicle Speed:	40	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:	40.0	feet
Centerline Dist. to Observer:	40.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.07	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.17	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.12	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.4	66.5	64.7	58.7	67.3	67.9
Medium Trucks:	62.4	60.9	54.5	53.0	61.5	61.7
Heavy Trucks:	63.7	62.3	53.3	54.5	62.9	63.0
Vehicle Noise:	70.4	68.7	65.4	60.9	69.4	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	79	169	365
CNEL:	39	84	181	391

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: San Bernardino Rd.
Road Segment: e/o Rimsdale Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,300 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,830 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.76	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-15.47	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-19.43	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.9	65.0	63.2	57.2	65.8	66.4
Medium Trucks:	61.1	59.6	53.3	51.7	60.2	60.4
Heavy Trucks:	63.0	61.6	52.5	53.8	62.1	62.3
Vehicle Noise:	69.1	67.4	64.0	59.6	68.1	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	65	139	300
CNEL:	32	69	149	320

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: San Bernardino Rd.
Road Segment: e/o Hollenbeck Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,000 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,400 vehicles
Vehicle Speed:	30 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	1.27	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	73.48	-15.97	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-19.92	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.8	61.9	60.2	54.1	62.7	63.4
Medium Trucks:	58.4	56.9	50.5	49.0	57.4	57.7
Heavy Trucks:	60.9	59.4	50.4	51.7	60.0	60.1
Vehicle Noise:	66.4	64.7	61.0	56.8	65.4	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	20	42	91	196
CNEL:	21	45	97	209

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Badillo St.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,780 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,878 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	0.79	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.45	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.41	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:	68.4	66.5	64.7	58.6	67.3	67.9
Medium Trucks:	62.1	60.6	54.3	52.7	61.2	61.4
Heavy Trucks:	63.0	61.6	52.5	53.8	62.1	62.3
Vehicle Noise:	70.2	68.5	65.3	60.6	69.2	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	95	204	440
CNEL:	47	102	219	472

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Badillo St.
Road Segment: w/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,980 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,998 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.57	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.67	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.63	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:	67.2	65.3	63.5	57.5	66.1	66.7
Medium Trucks:	61.2	59.7	53.3	51.8	60.2	60.5
Heavy Trucks:	62.5	61.1	52.0	53.3	61.6	61.8
Vehicle Noise:	69.2	67.5	64.2	59.6	68.2	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	82	176	378
CNEL:	41	87	188	405

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Badillo St.
Road Segment: e/o Armel Dr.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,900 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.35	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.89	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.85	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:	67.0	65.1	63.3	57.3	65.9	66.5
Medium Trucks:	61.0	59.5	53.1	51.5	60.0	60.2
Heavy Trucks:	62.3	60.9	51.8	53.1	61.4	61.6
Vehicle Noise:	69.0	67.3	64.0	59.4	68.0	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	79	170	366
CNEL:	39	84	182	392

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Puente Av.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,100	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,210	vehicles
Vehicle Speed:	40	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	-0.61	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-17.85	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.81	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:	65.0	63.1	61.3	55.3	63.9	64.5
Medium Trucks:	59.0	57.5	51.1	49.6	58.0	58.3
Heavy Trucks:	60.3	58.9	49.9	51.1	59.5	59.6
Vehicle Noise:	67.0	65.3	62.0	57.5	66.0	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	58	126	271
CNEL:	29	62	135	290

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040
Road Name: Puente Av.
Road Segment: e/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,370 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,337 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.40	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-16.84	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-20.79	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.5	63.6	61.9	55.8	64.4	65.0
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.1
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	67.8	66.1	62.6	58.2	66.8	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	52	113	243
CNEL:	26	56	120	260

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Lark Ellen Av.
Road Segment: n/o Cypress St.
Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,450 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,545 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.45	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.79	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.74	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.8	65.9	64.1	58.1	66.7	67.3
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.1
Heavy Trucks:	63.1	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	69.8	68.1	64.8	60.3	68.8	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	72	154	332
CNEL:	36	77	165	355

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Lark Ellen Av.
Road Segment: s/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,420 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,342 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.16	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-17.40	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.36	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.2	65.3	63.5	57.5	66.1	66.7
Medium Trucks:	61.2	59.7	53.3	51.8	60.2	60.5
Heavy Trucks:	62.5	61.1	52.0	53.3	61.6	61.8
Vehicle Noise:	69.2	67.5	64.2	59.6	68.2	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	65	140	302
CNEL:	32	70	150	324

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Lark Ellen Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,860 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,686 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.83	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.41	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.37	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.2	66.3	64.5	58.4	67.1	67.7
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.5
Heavy Trucks:	63.5	62.1	53.0	54.3	62.6	62.8
Vehicle Noise:	70.2	68.5	65.2	60.6	69.2	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	76	163	352
CNEL:	38	81	175	377

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Lark Ellen Av.
Road Segment: n/o Puente Av.
Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,240 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,024 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.62	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-15.62	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.57	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.0	67.1	65.3	59.2	67.9	68.5
Medium Trucks:	63.0	61.5	55.1	53.6	62.0	62.2
Heavy Trucks:	64.3	62.9	53.8	55.1	63.4	63.6
Vehicle Noise:	71.0	69.3	66.0	61.4	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	86	184	397
CNEL:	43	92	198	426

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Rimsdale Av.
Road Segment: s/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,620 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	262 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-7.26	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-24.49	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-28.45	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.1	58.2	56.4	50.4	59.0	59.6
Medium Trucks:	54.1	52.6	46.2	44.7	53.1	53.4
Heavy Trucks:	55.4	54.0	45.0	46.2	54.6	54.7
Vehicle Noise:	62.1	60.4	57.1	52.5	61.1	61.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	10	22	47	102
CNEL:	11	23	51	109

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Azusa Av.
Road Segment: n/o Cypress St.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,980	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,198	vehicles
Vehicle Speed:	40	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.98	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.26	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.21	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:	67.6	65.7	63.9	57.9	66.5	67.1
Medium Trucks:	61.6	60.1	53.7	52.2	60.6	60.9
Heavy Trucks:	62.9	61.5	52.5	53.7	62.1	62.2
Vehicle Noise:	69.6	67.9	64.6	60.1	68.6	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	87	187	403
CNEL:	43	93	200	432

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Azusa Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,460 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,146 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.88	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.36	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.32	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:	67.5	65.6	63.8	57.8	66.4	67.0
Medium Trucks:	61.5	60.0	53.6	52.1	60.5	60.8
Heavy Trucks:	62.8	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	69.5	67.8	64.5	60.0	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	85	184	397
CNEL:	42	92	197	425

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Azusa Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,460 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,346 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	2.26	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-14.97	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.93	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:	67.9	66.0	64.2	58.2	66.8	67.4
Medium Trucks:	61.9	60.4	54.0	52.5	60.9	61.2
Heavy Trucks:	63.2	61.8	52.7	54.0	62.3	62.5
Vehicle Noise:	69.9	68.2	64.9	60.3	68.9	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	42	91	195	421
CNEL:	45	97	209	451

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Azusa Av.
Road Segment: s/o Puente Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,150 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,715 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	2.90	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-14.34	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-18.30	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:	68.5	66.6	64.9	58.8	67.4	68.0
Medium Trucks:	62.5	61.0	54.6	53.1	61.6	61.8
Heavy Trucks:	63.8	62.4	53.4	54.6	63.0	63.1
Vehicle Noise:	70.5	68.8	65.5	61.0	69.5	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	46	100	215	464
CNEL:	50	107	231	497

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Hollenbeck Av.
Road Segment: n/o San Bernardino Rd.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,860 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,386 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.56	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-16.68	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-20.64	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.7	63.8	62.0	56.0	64.6	65.2
Medium Trucks:	59.9	58.4	52.1	50.5	59.0	59.2
Heavy Trucks:	61.8	60.4	51.3	52.6	60.9	61.1
Vehicle Noise:	67.9	66.2	62.8	58.4	66.9	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	25	54	116	249
CNEL:	27	57	123	266

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Hollenbeck Av.
Road Segment: s/o Badillo St

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,600 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,260 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.14	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-17.09	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-21.05	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.3	63.4	61.6	55.6	64.2	64.8
Medium Trucks:	59.5	58.0	51.7	50.1	58.6	58.8
Heavy Trucks:	61.4	60.0	50.9	52.2	60.5	60.7
Vehicle Noise:	67.5	65.8	62.3	58.0	66.5	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	50	108	234
CNEL:	25	54	116	250

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: San Bernardino Rd.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,480 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,848 vehicles
Vehicle Speed:	40 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.23	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.01	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.97	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	66.7	64.9	58.8	67.5	68.1
Medium Trucks:	62.6	61.1	54.7	53.2	61.6	61.9
Heavy Trucks:	63.9	62.5	53.4	54.7	63.0	63.2
Vehicle Noise:	70.6	68.9	65.6	61.0	69.6	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	81	174	374
CNEL:	40	86	186	401

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: San Bernardino Rd.
Road Segment: e/o Rimsdale Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,900 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,890 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.91	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-15.33	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-19.29	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.0	65.1	63.4	57.3	65.9	66.5
Medium Trucks:	61.3	59.8	53.4	51.9	60.3	60.6
Heavy Trucks:	63.1	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	69.3	67.6	64.1	59.7	68.3	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	31	66	142	306
CNEL:	33	70	152	327

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: San Bernardino Rd.
Road Segment: e/o Hollenbeck Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,240 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,424 vehicles
Vehicle Speed:	30 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:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	61.75	1.34	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	73.48	-15.89	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	79.92	-19.85	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.9	62.0	60.3	54.2	62.8	63.4
Medium Trucks:	58.5	56.9	50.6	49.0	57.5	57.7
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	66.4	64.7	61.1	56.9	65.4	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	20	43	92	199
CNEL:	21	46	98	212

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Badillo St.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,960 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,896 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	0.83	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.41	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.37	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:	68.4	66.5	64.7	58.7	67.3	67.9
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.5
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	70.2	68.5	65.3	60.7	69.2	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	95	206	443
CNEL:	48	102	221	475

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Badillo St.
Road Segment: w/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,240 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,024 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.62	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.62	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.57	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:	67.2	65.3	63.6	57.5	66.1	66.8
Medium Trucks:	61.2	59.7	53.4	51.8	60.3	60.5
Heavy Trucks:	62.6	61.1	52.1	53.3	61.7	61.8
Vehicle Noise:	69.3	67.5	64.2	59.7	68.2	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	82	177	382
CNEL:	41	88	190	409

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Badillo St.
Road Segment: e/o Armel Dr.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,260 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,926 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	1.41	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.83	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-19.79	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:	67.0	65.1	63.4	57.3	65.9	66.5
Medium Trucks:	61.0	59.5	53.2	51.6	60.1	60.3
Heavy Trucks:	62.3	60.9	51.9	53.1	61.5	61.6
Vehicle Noise:	69.0	67.3	64.0	59.5	68.0	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	80	171	369
CNEL:	40	85	183	395

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Puente Av.
Road Segment: w/o Lark Ellen Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,110 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,211 vehicles
Vehicle Speed:	40 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source 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:	66.51	-0.61	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-17.85	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-21.80	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:	65.0	63.1	61.3	55.3	63.9	64.5
Medium Trucks:	59.0	57.5	51.1	49.6	58.1	58.3
Heavy Trucks:	60.3	58.9	49.9	51.1	59.5	59.6
Vehicle Noise:	67.0	65.3	62.0	57.5	66.0	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	58	126	271
CNEL:	29	63	135	290

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Future 2040 + P
Road Name: Puente Av.
Road Segment: e/o Azusa Av.

Project Name: Covina Bowl Noise Impact
Job Number: 12965

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,390 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,339 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.069
Medium Trucks:	35.823
Heavy Trucks:	35.847

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.41	2.02	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	75.75	-16.83	2.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	81.57	-20.79	2.06	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.5	63.6	61.9	55.8	64.4	65.0
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.1
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	67.8	66.1	62.6	58.2	66.8	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	52	113	243
CNEL:	26	56	121	260

Monday, June 22, 2020

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APPENDIX 8.1:

ON-SITE TRAFFIC NOISE LEVEL CALCULATIONS

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: First Floor With Wall
Road Name: San Bernardino Rd.
Lot No: 98

Project Name: Covina Bowl
Job Number: 12965
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,030 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,703 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	57.0 feet
Centerline Dist. to Observer:	57.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	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:	54.314
Medium Trucks:	54.151
Heavy Trucks:	54.167

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	1.45	-0.64	-1.20	*-4.68*	0.000	0.000
Medium Trucks:	74.83	-15.79	-0.62	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	80.05	-19.74	-0.62	-1.20	*-5.36*	0.000	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	62.8	61.1	55.0	63.6	64.2
Medium Trucks:	57.2	55.7	49.4	47.8	56.3	56.5
Heavy Trucks:	58.5	57.1	48.0	49.3	57.6	57.8
Vehicle Noise:	66.2	64.5	61.5	56.6	65.2	65.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.7	62.8	61.1	55.0	63.6	64.2
Medium Trucks:	57.2	55.7	49.4	47.8	56.3	56.5
Heavy Trucks:	58.5	57.1	48.0	49.3	57.6	57.8
Vehicle Noise:	66.2	64.5	61.5	56.6	65.2	65.7

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: First Floor With Wall
Road Name: Badillo St.
Lot No: 55

Project Name: Covina Bowl
Job Number: 12965
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,590 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,859 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 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
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:	57.767
Medium Trucks:	57.613
Heavy Trucks:	57.628

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	1.25	-1.04	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	76.31	-15.99	-1.03	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.16	-19.94	-1.03	-1.20	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.4	64.5	62.7	56.6	65.3	65.9
Medium Trucks:	58.1	56.6	50.2	48.7	57.1	57.4
Heavy Trucks:	59.0	57.6	48.5	49.8	58.1	58.3
Vehicle Noise:	67.6	65.8	63.1	58.0	66.6	67.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.4	64.5	62.7	56.6	65.3	65.9
Medium Trucks:	58.1	56.6	50.2	48.7	57.1	57.4
Heavy Trucks:	59.0	57.6	48.5	49.8	58.1	58.3
Vehicle Noise:	67.6	65.8	63.1	58.0	66.6	67.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: First Floor With Wall
Road Name: Rimsdale Av.
Lot No: 131

Project Name: Covina Bowl
Job Number: 12965
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,430 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	243 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	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
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:	49.890
Medium Trucks:	49.712
Heavy Trucks:	49.730

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-5.54	-0.09	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	71.09	-22.78	-0.07	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	77.24	-26.74	-0.07	-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:	52.6	50.7	48.9	42.9	51.5	52.1
Medium Trucks:	47.0	45.5	39.2	37.6	46.1	46.3
Heavy Trucks:	49.2	47.8	38.8	40.0	48.4	48.5
Vehicle Noise:	55.0	53.3	49.7	45.5	54.0	54.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.6	50.7	48.9	42.9	51.5	52.1
Medium Trucks:	47.0	45.5	39.2	37.6	46.1	46.3
Heavy Trucks:	49.2	47.8	38.8	40.0	48.4	48.5
Vehicle Noise:	55.0	53.3	49.7	45.5	54.0	54.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Second Floor With Wall
Road Name: San Bernardino Rd.
Lot No: 98

Project Name: Covina Bowl
Job Number: 12965
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,030 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,703 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	57.0 feet
Centerline Dist. to Observer:	57.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	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:	55.866
Medium Trucks:	55.335
Heavy Trucks:	54.414

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	1.45	-0.83	-1.20	*-12.04*	0.000	0.000
Medium Trucks:	74.83	-15.79	-0.76	-1.20	*-12.58*	0.000	0.000
Heavy Trucks:	80.05	-19.74	-0.65	-1.20	*-13.94*	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:	64.5	62.6	60.9	54.8	63.4	64.0
Medium Trucks:	57.1	55.6	49.2	47.7	56.1	56.4
Heavy Trucks:	58.4	57.0	48.0	49.2	57.6	57.7
Vehicle Noise:	66.1	64.3	61.4	56.5	65.0	65.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.5	62.6	60.9	54.8	63.4	64.0
Medium Trucks:	57.1	55.6	49.2	47.7	56.1	56.4
Heavy Trucks:	58.4	57.0	48.0	49.2	57.6	57.7
Vehicle Noise:	66.1	64.3	61.4	56.5	65.0	65.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Second Floor With Wall
Road Name: Badillo St.
Lot No: 55

Project Name: Covina Bowl
Job Number: 12965
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,590 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,859 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 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):	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:	59.228
Medium Trucks:	58.728
Heavy Trucks:	57.861

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	1.25	-1.21	-1.20	*-12.22*	0.000	0.000
Medium Trucks:	76.31	-15.99	-1.15	-1.20	*-12.70*	0.000	0.000
Heavy Trucks:	81.16	-19.94	-1.05	-1.20	*-13.91*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.5	65.1	65.7
Medium Trucks:	58.0	56.5	50.1	48.6	57.0	57.3
Heavy Trucks:	59.0	57.5	48.5	49.8	58.1	58.2
Vehicle Noise:	67.5	65.7	62.9	57.9	66.4	66.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.5	65.1	65.7
Medium Trucks:	58.0	56.5	50.1	48.6	57.0	57.3
Heavy Trucks:	59.0	57.5	48.5	49.8	58.1	58.2
Vehicle Noise:	67.5	65.7	62.9	57.9	66.4	66.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Second Floor With Wall
Road Name: Rimsdale Av.
Lot No: 131

Project Name: Covina Bowl
Job Number: 12965
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,430 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	243 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	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:	51.575
Medium Trucks:	51.000
Heavy Trucks:	49.999

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-5.54	-0.31	-1.20	*-11.82*	0.000	0.000
Medium Trucks:	71.09	-22.78	-0.23	-1.20	*-12.43*	0.000	0.000
Heavy Trucks:	77.24	-26.74	-0.10	-1.20	*-13.97*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.4	50.5	48.7	42.7	51.3	51.9
Medium Trucks:	46.9	45.4	39.0	37.5	45.9	46.2
Heavy Trucks:	49.2	47.8	38.7	40.0	48.3	48.5
Vehicle Noise:	54.8	53.1	49.5	45.3	53.8	54.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.4	50.5	48.7	42.7	51.3	51.9
Medium Trucks:	46.9	45.4	39.0	37.5	45.9	46.2
Heavy Trucks:	49.2	47.8	38.7	40.0	48.3	48.5
Vehicle Noise:	54.8	53.1	49.5	45.3	53.8	54.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Third Floor With Wall
Road Name: San Bernardino Rd.
Lot No: 98

Project Name: Covina Bowl
Job Number: 12965
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,030 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,703 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	57.0 feet
Centerline Dist. to Observer:	57.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	25.0 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:	59.582
Medium Trucks:	58.655
Heavy Trucks:	56.690

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	1.45	-1.25	-1.20	*-19.33*	0.000	0.000
Medium Trucks:	74.83	-15.79	-1.14	-1.20	*-20.24*	0.000	0.000
Heavy Trucks:	80.05	-19.74	-0.92	-1.20	*-22.58*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.1	62.2	60.5	54.4	63.0	63.6
Medium Trucks:	56.7	55.2	48.8	47.3	55.7	56.0
Heavy Trucks:	58.2	56.8	47.7	49.0	57.3	57.5
Vehicle Noise:	65.7	63.9	61.0	56.1	64.7	65.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.1	62.2	60.5	54.4	63.0	63.6
Medium Trucks:	56.7	55.2	48.8	47.3	55.7	56.0
Heavy Trucks:	58.2	56.8	47.7	49.0	57.3	57.5
Vehicle Noise:	65.7	63.9	61.0	56.1	64.7	65.1

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Third Floor With Wall
Road Name: Badillo St.
Lot No: 55

Project Name: Covina Bowl
Job Number: 12965
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,590 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,859 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 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):	25.0 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:	62.746
Medium Trucks:	61.866
Heavy Trucks:	60.007

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	67.36	1.25	-1.58	-1.20	*-19.85*	0.000	0.000
Medium Trucks:	76.31	-15.99	-1.49	-1.20	*-20.68*	0.000	0.000
Heavy Trucks:	81.16	-19.94	-1.29	-1.20	*-22.78*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.8	63.9	62.2	56.1	64.7	65.3
Medium Trucks:	57.6	56.1	49.8	48.2	56.7	56.9
Heavy Trucks:	58.7	57.3	48.3	49.5	57.9	58.0
Vehicle Noise:	67.1	65.3	62.6	57.5	66.1	66.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.8	63.9	62.2	56.1	64.7	65.3
Medium Trucks:	57.6	56.1	49.8	48.2	56.7	56.9
Heavy Trucks:	58.7	57.3	48.3	49.5	57.9	58.0
Vehicle Noise:	67.1	65.3	62.6	57.5	66.1	66.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Third Floor With Wall
Road Name: Rimsdale Av.
Lot No: 131

Project Name: Covina Bowl
Job Number: 12965
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,430 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	243 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	25.0 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:	55.579
Medium Trucks:	54.584
Heavy Trucks:	52.467

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-5.54	-0.79	-1.20	*-18.69*	0.000	0.000
Medium Trucks:	71.09	-22.78	-0.67	-1.20	*-19.70*	0.000	0.000
Heavy Trucks:	77.24	-26.74	-0.42	-1.20	*-22.33*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	51.9	50.0	48.2	42.2	50.8	51.4
Medium Trucks:	46.4	44.9	38.6	37.0	45.5	45.7
Heavy Trucks:	48.9	47.5	38.4	39.7	48.0	48.2
Vehicle Noise:	54.4	52.7	49.1	44.9	53.4	53.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	51.9	50.0	48.2	42.2	50.8	51.4
Medium Trucks:	46.4	44.9	38.6	37.0	45.5	45.7
Heavy Trucks:	48.9	47.5	38.4	39.7	48.0	48.2
Vehicle Noise:	54.4	52.7	49.1	44.9	53.4	53.8

APPENDIX 10.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS

12965

CadnaA Noise Prediction Model: 12965.cna
Date: 26.05.20
Analyst: B. Lawson

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	41.5	40.3	47.0	60.0	50.0	0.0				5.00	a	6058216.38	2343878.60	5.00
RECEIVERS		R2	35.5	33.8	40.4	65.0	55.0	0.0				5.00	a	6058283.91	2342894.46	5.00
RECEIVERS		R3	38.5	36.6	43.2	60.0	50.0	0.0				5.00	a	6058228.51	2343168.10	5.00
RECEIVERS		R4	43.0	41.0	47.7	60.0	50.0	0.0				5.00	a	6058281.93	2343410.69	5.00
RECEIVERS		R5	41.7	40.3	47.0	60.0	50.0	0.0				5.00	a	6058728.47	2343205.77	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			K0	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night				X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC01	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	0.0	5.00	g	6058557.33	2343640.50	30.00
POINTSOURCE		AC02	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	0.0	5.00	g	6058537.88	2343500.77	30.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)
AREASOURCE		PARKING	88.6	88.6	88.6	56.2	56.2	56.2	Lw	88.6				

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
AREASOURCE	5.00	a			6058515.58	2343769.20	5.00	0.00
					6058634.41	2343769.20	5.00	0.00
					6058631.95	2343517.10	5.00	0.00
					6058585.62	2343517.37	5.00	0.00
					6058588.89	2343656.64	5.00	0.00
					6058585.89	2343663.18	5.00	0.00
					6058580.17	2343666.45	5.00	0.00
					6058575.81	2343668.63	5.00	0.00
					6058513.67	2343669.45	5.00	0.00

Building(s)

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING		BUILDING00001	x	0		25.00	a	6058541.87	2343663.88	25.00	0.00
								6058577.59	2343663.15	25.00	0.00
								6058577.04	2343573.23	25.00	0.00
								6058565.44	2343573.05	25.00	0.00
								6058564.90	2343520.47	25.00	0.00
								6058561.45	2343512.86	25.00	0.00
								6058554.02	2343510.14	25.00	0.00
								6058548.76	2343509.05	25.00	0.00
								6058548.76	2343496.00	25.00	0.00
								6058563.99	2343495.81	25.00	0.00
								6058563.99	2343479.32	25.00	0.00
								6058522.65	2343479.86	25.00	0.00
								6058523.38	2343521.20	25.00	0.00
								6058511.78	2343521.92	25.00	0.00
								6058512.86	2343647.74	25.00	0.00
								6058541.15	2343647.74	25.00	0.00

APPENDIX 11.1:

CADNAA CONSTRUCTION NOISE MODEL INPUTS

12965

CadnaA Noise Prediction Model: 12965_Construction.cna
Date: 26.05.20
Analyst: B. Lawson

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	67.4	67.4	74.0	85.0	0.0	0.0				5.00	a	6058216.38	2343878.60	5.00
RECEIVERS		R2	69.7	69.7	76.4	85.0	0.0	0.0				5.00	a	6058283.91	2342894.46	5.00
RECEIVERS		R3	76.4	76.4	83.0	85.0	0.0	0.0				5.00	a	6058228.51	2343168.10	5.00
RECEIVERS		R4	75.9	75.9	82.6	85.0	0.0	0.0				5.00	a	6058281.93	2343410.69	5.00
RECEIVERS		R5	72.2	72.2	78.9	85.0	0.0	0.0				5.00	a	6058728.47	2343205.77	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Operating Time		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)
SITEBOUNDARY		Site Preparation	119.0	119.0	119.0	75.3	75.3	75.3	Lw"	75.3				

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	8.00	a			6058405.15	2343765.40	8.00	0.00
					6058622.48	2343779.03	8.00	0.00
					6058626.59	2343778.95	8.00	0.00
					6058630.63	2343778.19	8.00	0.00
					6058634.48	2343776.79	8.00	0.00
					6058638.06	2343774.77	8.00	0.00
					6058641.26	2343772.19	8.00	0.00
					6058643.99	2343769.12	8.00	0.00
					6058646.18	2343765.65	8.00	0.00
					6058647.78	2343761.86	8.00	0.00
					6058648.73	2343757.87	8.00	0.00
					6058649.01	2343753.77	8.00	0.00
					6058639.84	2343040.51	8.00	0.00
					6058639.75	2343036.78	8.00	0.00
					6058639.06	2343033.12	8.00	0.00
					6058637.80	2343029.62	8.00	0.00
					6058635.99	2343026.37	8.00	0.00
					6058633.68	2343023.44	8.00	0.00
					6058630.94	2343020.93	8.00	0.00
					6058627.82	2343018.89	8.00	0.00
					6058624.42	2343017.38	8.00	0.00
					6058620.82	2343016.43	8.00	0.00
					6058617.11	2343016.07	8.00	0.00
					6058542.29	2343017.97	8.00	0.00
					6058472.04	2343019.77	8.00	0.00
					6058372.06	2343022.36	8.00	0.00
					6058306.37	2343023.98	8.00	0.00
					6058238.39	2343025.74	8.00	0.00
					6058243.34	2343396.63	8.00	0.00
					6058310.73	2343395.19	8.00	0.00
					6058376.41	2343393.66	8.00	0.00
					6058380.75	2343763.87	8.00	0.00
					6058386.50	2343764.23	8.00	0.00

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)