Bedford Marketplace

NOISE IMPACT ANALYSIS

CITY OF CORONA

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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	Bedford Marketplace
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 Bedford Marketplace development ("Project") an expansion of the previously approved commercial development area included within the Arantine Hills Specific Plan. The 80,000 square feet (sf) of commercial retail use included in the Arantine Hills Specific Plan was evaluated in prior studies prepared for amendments to the Arantine Hills Specific Plan. The proposed Project represents the expansion of Bedford Marketplace from 80,000 sf to 135,000 sf of retail uses and a 135-room hotel. Consistent with the *Bedford Marketplace Traffic Study* (1) prepared by Urban Crossroads, Inc., the incremental expansion of Bedford Marketplace constitutes the "Project" analyzed in this study. Reference to "Bedford Marketplace" includes the total development of the center, equal to the combination of the proposed Project and the previously approved 80,000 sf in the Arantine Hills Specific Plan. The Project site is located south of Eagle Glen Parkway – Cajalco Road and west of the I-15 Freeway in the City of Corona

This study has been prepared consistent with applicable City of Corona noise standards, and significance criteria based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (2)

OFF-SITE PROJECT TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the proposed Project will influence the traffic noise levels in surrounding off-site areas. To quantify the off-site traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on 21 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 *Bedford Marketplace Traffic Study*. (1) To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing, Interim Year 2021, and Horizon Year 2035 traffic conditions. The analysis shows that the unmitigated Project-related traffic noise level increases under all traffic scenarios will be *less than significant*.

SOIL IMPORT/EXPORT HAUL TRUCK OFF-SITE TRAFFIC NOISE ANALYSIS

To bring the Modified Bedford Marketplace Project Site up to an elevation similar (within five feet) of the existing 10-acre commercial pad, import of approximately 440,000 cubic yards of dirt is required. The import operation is expected to include 250 full loads per night, assuming 15 cubic yards per load, for a total of 3,750 cubic yards per night. To import 440,000 cubic yards, approximately 118 nights of import would be required.

The Project proposes to import dirt during the hours (8:00 p.m. to 4:00 a.m.) and complete grading operations both during daytime and nighttime hours. A source of import has been identified from the FST Sand and Gravel Mine, located east of the I-15 Freeway. The dirt would be hauled from the borrow site on Minnesota Road to Sherborn Street to Magnolia Avenue to the I-15 Freeway southbound on ramp at Magnolia Avenue, exit at Cajalco Road and enter the

Modified Project Site by crossing Cajalco Road from the southbound off-ramp with traffic control. Trucks would return onto Cajalco Road, enter I-15 Freeway northbound to Magnolia Avenue to Sherborn Street and travel south to the borrow site.

The proposed soil import/export haul route was specially developed to avoid potentially significant impacts to potential noise sensitive residential land uses. The off-site soil import/export analysis shows that Project haul truck trip will generate a noise level increase ranging from 0.2 dBA CNEL on the I-15 Freeway to 5.4 dBA CNEL on Sherborn Street. A review of the haul route shows that the only adjacent noise sensitive residential land uses are located adjacent to the I-15 Freeway. Many of the noise sensitive residential land uses near the I-15 Freeway benefit from existing Caltrans sound walls that have been developed to reduce traffic noise. Based on the significance criteria outlined above, the Project soil import/export truck trip-related noise level increases are considered *less than significant* impacts at the land uses adjacent to roadways conveying Project haul truck traffic.

ON-SITE TRAFFIC NOISE IMPACTS

An on-site exterior noise impact analysis has been completed to determine the traffic noise exposure and to identify potential necessary noise abatement measures for the proposed Bedford Marketplace Project. It is expected that the primary source of noise impacts to the Project site will be traffic noise from the I-15 Freeway. To control transportation related noise sources, the City of Corona has adopted exterior and interior noise standards by land use type.

EXTERIOR NOISE

The City of Corona has adopted an exterior noise standard of 65 dBA CNEL for noise sensitive land uses. The exterior noise standards typically apply to outdoor areas where people congregate. The only noise sensitive outdoor area in the proposed Bedford Marketplace is the outdoor pool area. The City of Corona does not identify any exterior noise standards for any of the commercial land use activities such as the outdoor patio areas for proposed restaurant uses. The on-site traffic noise level impacts indicate that outdoor hotel pool area will experience unmitigated exterior noise levels of 52.3 dBA CNEL. Since the unmitigated on-site traffic noise levels satisfy the City of Corona 65 dBA CNEL exterior noise level standards, the on-site traffic noise level impacts are considered as *less than significant*.

INTERIOR NOISE

To satisfy the City of Corona 45 dBA CNEL interior noise level criteria for noise sensitive land use, hotel rooms facing the I-15 Freeway will require a Noise Level Reduction (NLR) of up to 26.5 dBA and a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning). In order to meet the City of Corona 45 dBA CNEL interior noise standards, the Project shall provide a minimum STC ratings of 30 for windows facing the I-15 Freeway. With the recommended upgraded windows, the future on-site interior traffic noise impacts are expected to meet the City of Corona 45 dBA CNEL interior noise level standards and will be *less than significant*.

PROJECT OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected noise sources from the Bedford Marketplace site, this analysis estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. The normal activities associated with the proposed Bedford Marketplace are anticipated to include roof-top air conditioning units, drive-thru speakerphones, trash enclosures, parking lots, gas station activity, car wash tunnel, car wash vacuums, and outdoor playground activity.

The analysis shows that the Project-related operational noise levels will satisfy the City of Corona daytime and nighttime exterior noise level standards at the closest noise-sensitive receiver locations in the Project study area. Therefore, the operational noise impacts are considered *less than significant* at all receiver locations. In addition, the project operational noise level contribution analysis shows Project-related incremental noise level increase to the ambient noise environment would be *less than significant* at all receiver locations.

SOIL IMPORT/EXPORT CONSTRUCTION NOISE ANALYSIS

The applicant has identified two potential borrow sites to provide the necessary fill dirt. The FST Sand and Gravel Mine, located east of the I-15 Freeway and the Arantine Hills Specific Plan Phase 2B site.

FST SAND AND GRAVEL MINE BORROW SITE

During the nighttime hours, dirt would be imported to the Modified Project Site, dumped, and placed by grading equipment. Daytime grading activities would initially last for approximately two weeks and begin before import and overlap with initial import operations. The daytime activities include remedial grading, which requires the over-excavation of approximately four to six feet below existing ground surface. The over-excavated material would be stockpiled on site. Additional daytime grading would occur after imported material has be placed in the over-excavated areas to bring the site closer to proposed grades. The stockpiled material would then be placed over the imported material to create the finished building pad, compacted to meet geotechnical specifications.

According to the Project applicant, every effort will be made to limit on-site construction activities particularly during the noise sensitive nighttime hours. For this reason, the Applicant is proposing to limit nighttime operations to permit only the essential equipment needed to support the soil import/export haul truck operations. The results of the soil import/export construction noise analysis, all nearby receiver locations will experience *less than significant* impacts due to the daytime and nighttime soil import/export noise construction noise levels at the Project site.

PHASE 2B BORROW SITE

Preliminary estimates suggest that the existing Phase 2B site will be lowered by approximately 13 feet to provide the necessary supply of dirt for import. Unlike the FST Sand and Gravel Mine borrow site, Phase 2B will not require any off-site haul trucks. In addition, due to the proximity of Phase 2B to the Bedford Marketplace, import of dirt will limited to the daytime hours from 7:00 a.m. to 7:00 p.m.

SOIL IMPORT/EXPORT CONSTRUCTION NOISE ANALYSIS (DAYTIME)

The analysis shows that either borrow site will satisfy the City of Corona maximum acceptable threshold for determining the impacts due to Project construction for sensitive receiver's daytime exterior noise level of 75 dBA L_{max}. Therefore, based on the results of the analysis, all nearby receiver locations will experience *less than significant* impacts due to the daytime soil import/export noise construction noise levels at the Project site.

SOIL IMPORT/EXPORT CONSTRUCTION NOISE ANALYSIS (NIGHTTIME)

The estimated Project nighttime construction noise levels from the import of dirt from the FST Sand and Gravel Mine will satisfy the City of Corona 50 dBA L_{max} stationary source nighttime noise level thresholds at all receiver locations. Therefore, based on the results of the analysis, all nearby receiver locations will experience *less than significant* impacts due to the nighttime soil import/export noise construction noise levels at the Project site. However, planned nighttime Project soil import/export activity will require a noise variance consistent with the provisions outlined in the City of Corona Municipal Code Section 17.84.040(H)(1) to perform the evening and nighttime grading activities

PROJECT SITE CONSTRUCTION NOISE ANALYSIS

Construction-related noise impacts are expected to create temporary and intermittent high-level noise conditions at receivers surrounding the Project site when certain activities occur at the Project site boundary. Using sample reference noise levels to represent the planned construction activities of the Bedford Marketplace site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. The analysis shows that the Project-related short-term construction noise levels, are expected to approach 63.9 dBA L_{max} and will not exceed the 75 dBA L_{max} construction noise level threshold at the nearby sensitive receiver locations. Therefore, based on the results of this analysis, all nearby sensitive receiver locations will experience *less than significant* impacts due to Project site construction noise levels.

SUMMARY OF CEQA SIGNIFICANCE FINDINGS

The results of this Bedford Marketplace 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. (2).

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	**Mitigated**
Off-Site Traffic Noise Levels	7	*Less Than Significant*	*n/a*
Soil Import/Export Haul Trucks		*Less Than Significant*	*n/a*
On-Site Exterior Traffic Noise Levels	8	*Less Than Significant*	*n/a*
On-Site Interior Traffic Noise Levels		*Less Than Significant*	*n/a*
Operational Noise Levels	10	*Less Than Significant*	*n/a*
Soil Import/Export Construction	11	*Less Than Significant*	*n/a*
Construction Noise Levels		*Less Than Significant*	*n/a*
Construction Vibration Levels		*Less Than Significant*	*n/a*

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Bedford Marketplace ("Project") an expansion of the previously approved commercial development area included within the Arantine Hills Specific Plan. The 80,000 square feet (sf) of commercial retail use included in the Arantine Hills Specific Plan was evaluated in prior studies prepared for amendments to the Arantine Hills Specific Plan. The proposed Project represents the expansion of Bedford Marketplace from 80,000 sf to 135,000 sf of retail uses and a 135-room hotel. Consistent with the *Bedford Marketplace Traffic Study* (1) prepared by Urban Crossroads, Inc., the incremental expansion of Bedford Marketplace constitutes the "Project" analyzed in this study. Reference to "Bedford Marketplace" includes the total development of the center, equal to the combination of the proposed Project and the previously approved 80,000 sf in the Arantine Hills Specific Plan. Based on the currently approved commercial trip generation in the Arantine Hills Traffic Assessment (November 2018), the Project is anticipated to generate an additional 2,061 external trips per day.

This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for transportation noise analysis, soil import/export haul traffic noise 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 Project site is located south of Eagle Glen Parkway – Cajalco Road and west of the I-15 Freeway in the City of Corona as shown on Exhibit 1-A. The Project site is currently vacant. Nearby existing residential land uses are located north, west, and south of the Project site. Commercial land uses near the Project site are located to the north at the I-15 Freeway southbound off-ramp, and east of the I-15 Freeway north of Cajalco Road. The Corona Municipal Airport is located approximately 6.5 miles northwest of the Project site.

1.2 BEDFORD MARKETPLACE LAND USE DESCRIPTION

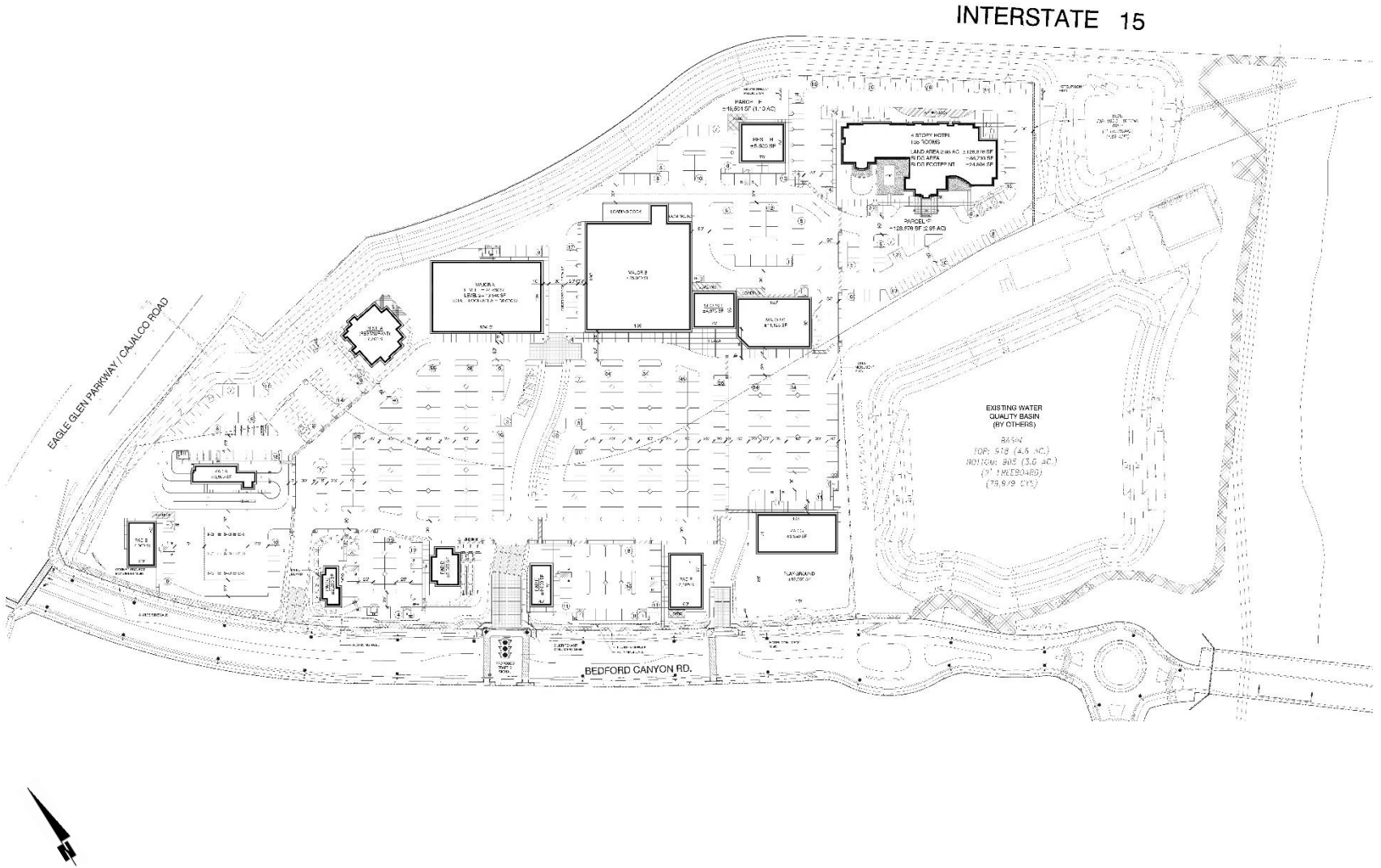
The Bedford Marketplace site plan (shown on Exhibit 1-B) expands the approved commercial site and is proposed to consist of the following uses:

- Hotel - 135 rooms
- Health/fitness club - 38,000 sf
- Day Care Center - 9,990 sf
- Retail Shopping Center – 51,000 sf
- Bank – 6,562 sf
- Restaurant – 21,230 sf
- Gas Station – 18 vehicle fueling positions (vfp's)
- Automated Car Wash – 3,600 sf

The on-site Project-related noise sources are expected to include: roof-top air conditioning units, drive-thru speakerphones, trash enclosures, parking lots, gas station activity, car wash tunnel, car wash vacuums, and outdoor playground activity. This noise analysis is intended to describe noise level impacts associated with the expected typical, 24-hour seven days per week operational activities at the Project site.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: BEDFORD MARKETPLACE SITE PLAN



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2 FUNDAMENTALS

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

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (3) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA at approximately 100 feet, which can cause serious discomfort. (4) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

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

To describe the time-varying character of environmental noise, the statistical or percentile noise descriptors L_{50}, L_{25}, L_8 and L_2, are commonly used. The percentile noise descriptors are the noise levels equaled or exceeded during 50 percent, 25 percent, 8 percent and 2 percent of a stated time. Sound levels associated with the L_2 and L_8 typically describe transient or short-term events, while levels associated with the L_{50} describe the steady state (or median) noise conditions. The City of Corona relies on the percentile noise levels to describe the stationary source noise level limits. While the L_{50} describes the noise levels occurring 50 percent of the time, the L_{eq} accounts for the total energy (average) observed for the entire hour.

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 Corona relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

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

2.3.1 GEOMETRIC SPREADING

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

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (5)

2.3.3 ATMOSPHERIC EFFECTS

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

2.3.4 SHIELDING

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

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. (5)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (6)

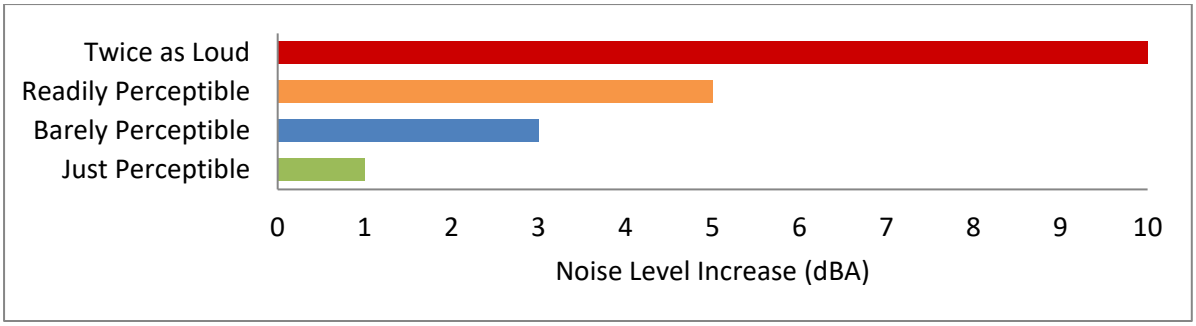
2.7 COMMUNITY RESPONSE TO NOISE

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. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (7) 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. (7) 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*. (5)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



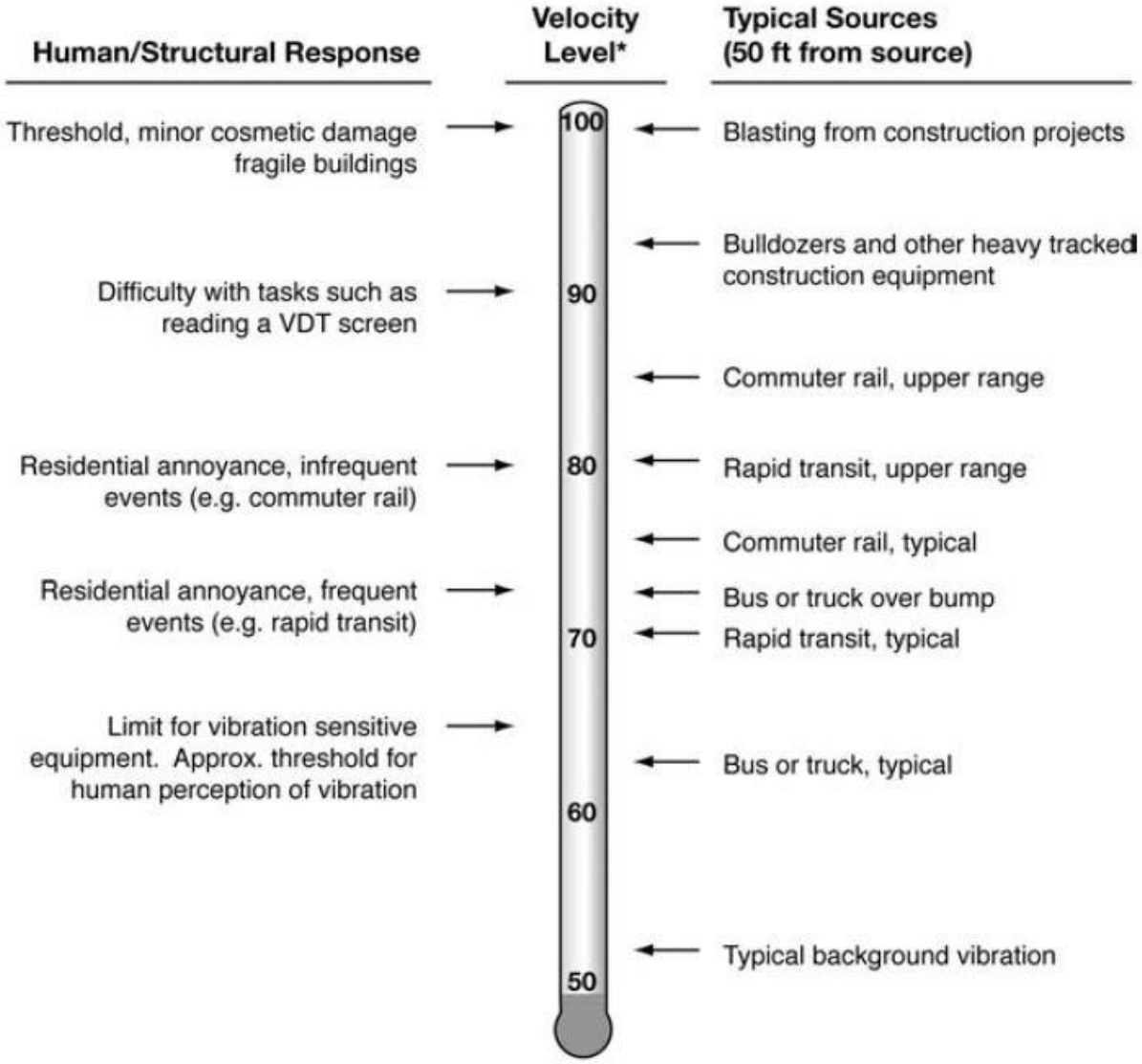
2.8 VIBRATION

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

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). (8) 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 GREEN BUILDING STANDARDS CODE

The State of California's Green Building Standards Code contains mandatory measures for non-residential building construction in Section 5.507 on Environmental Comfort. (9) 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 non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available, and the noise level exceeds 65 dBA L_{eq} for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required (Section 5.507.4.1).

3.3 CITY OF CORONA GENERAL PLAN PUBLIC HEALTH AND SAFETY ELEMENT

The City of Corona has adopted a Noise section in its Public Health and Safety Element of the General Plan to control and abate environmental noise, and to protect the citizens of the City of Corona from excessive exposure to noise. (10) The Public Health and Safety Element specifies the maximum allowable exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports and railroads. In addition, the Public

Health and Safety Element identifies several polices to minimize the impacts of excessive noise levels throughout the community and establishes noise level requirements for all land uses. To protect City of Corona residents from excessive noise, the Public Health and Safety Element contains the following six goals:

11.4 Ensure that appropriate actions are taken to protect residents, visitors, and noise-sensitive land uses from adverse human health and environmental impacts created by excessive noise levels from ambient sources.

11.5 Prevent and mitigate the adverse impacts of excessive ambient noise exposure on residents, employees, visitors, and noise-sensitive land uses within the City of Corona.

11.6 Provide sufficient information concerning community noise levels to ensure that noise can be objectively considered and incorporated into land use planning.

11.7 Provide for the reduction of noise spillover or encroachment where the noise environment from commercial and industrial land uses is unacceptable; and protect and maintain adjoining residential areas and other noise-sensitive areas having acceptable noise environments.

11.8 Minimize potentially adverse noise impacts associated with the development of mixed-use structures in which residential dwelling units are proposed above ground floor commercial or institutional uses.

11.9 Minimize noise impacts created by the Santa Fe railroad transit on residential areas and other noise-sensitive land use areas.

To protect its residents, visitors, and noise-sensitive land uses from high levels of noise (Goal 11.4), Table 4 of the Public Health and Safety Element identifies guidelines to evaluate proposed developments based on exterior and interior noise level limits for land uses. The Public Health and Safety Element requires new developments in areas where existing ambient exterior noise levels already exceed 65 dBA CNEL to include satisfactory buffering or construction mitigation measures to reduce noise impacts to levels lower than the standards found in Table 5 (Goal 11.5). To satisfy Goal 11.6, the City will maintain its Noise Ordinance and noise regulations to incorporate noise considerations into land use planning decisions for future incompatibilities. The intent of Goal 11.7 is to require new commercial and industrial uses to include mitigation measures in the site design in order to reduce impacts to neighboring noise-sensitive land uses. To mitigate the noise from mixed-use development (Goal 11.8), the Public Health and Safety Element requires mixed-use structures to incorporate noise reducing design elements and prohibits high noise-generating uses below or near residential land uses unless a noise analysis can demonstrate appropriate noise mitigation is attainable. Goal 11.9 seeks to prevent current and future operations of the Santa Fe railroad from impacting noise-sensitive land uses through rail line maintenance, noise mitigation features, and lower speed limits during early morning and late evening hours. (10)

3.3.1 LAND USE COMPATIBILITY

The noise criteria identified in the City of Corona Public Health and Safety Element (Table 4) are guidelines to evaluate the land use compatibility of transportation related noise. The compatibility criteria, shown on Exhibit 3-A, provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels

The *Land Use Noise Compatibility Matrix* describes categories of compatibility and not specific noise standards. The proposed Bedford Marketplace contains a hotel, health/fitness club, day care center, retail shopping center, bank, restaurants, gas station and automated car wash uses.

These general commercial land uses are considered *clearly compatible* with unmitigated exterior noise levels of less than 60 dBA CNEL, *normally compatible* with unmitigated exterior noise levels approaching 70 dBA CNEL and *normally incompatible* with unmitigated exterior noise levels approaching 80 dBA CNEL. For *normally incompatible* land use, *new construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.*

3.3.2 ON-SITE TRANSPORTATION NOISE STANDARDS

The City of Corona General Plan Public Health and Safety Element specifies the maximum noise levels allowable for new developments impacted by transportation noise sources such as arterial roads, freeways, airports and railroads.

For noise-sensitive uses, Table 5 *Interior and Exterior Noise Standards* of the Public Health and Safety Element indicates that the exterior noise levels shall not exceed 65 dBA CNEL and interior noise levels of 45 dBA CNEL. The 65 dBA CNEL exterior noise standards typically apply to outdoor areas where people congregate. In relation to the proposed Bedford Marketplace, the 65 dBA CNEL exterior noise standards apply only to the hotel outdoor pool area. The City of Corona does not identify any exterior noise standards for other commercial land use activities such as restaurant outdoor patio areas. The City of Corona transportation noise standards are shown on Exhibit 3-B.

EXHIBIT 3-A: LAND USE NOISE COMPATIBILITY MATRIX

Land Use Categories		*Community Noise Equivalent Level CNEL*						
Categories	*Uses*	*<55*	*60*	*65*	*70*	*75*	*80>*	
RESIDENTIAL	Single Family, Duplex	A	A	B	B	D	D	D
	Multiple Family	A	A	B	B	C	D	D
RESIDENTIAL	Mobile Home	A	A	B	C	C	D	D
COMMERCIAL Regional, District	Hotel, Motel Transient Lodging	A	A	B	B	C	C	D
COMMERCIAL Regional, Village District, Special	Commercial Retail, Bank, Restaurant, Movie Theatre	A	A	A	A	B	B	C
COMMERCIAL OFFICE INSTITUTIONAL	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
COMMERCIAL Recreation INSTITUTIONAL Civic Center	Amphitheatre, Concert Hall Auditorium, Meeting Hall	B	B	C	C	D	D	D
COMMERCIAL Recreation	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
COMMERCIAL General, Special INDUSTIRAL, INSTITUTIONAL	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
INSTITUTIONAL General	Hospital, Church, Library, Schools' Classroom	A	A	B	C	C	D	D
OPEN SPACE	Parks	A	A	A	B	C	D	D
OPEN SPACE	Golf Course, Cemeteries, Nature Centers Wildlife Reserves, Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C
AGRICULTURE	Agriculture	A	A	A	A	A	A	A

Interpretation

Zone A Clearly Compatible	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
Zone B Normally Compatible	New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice. Note that residential uses are prohibited with airport CNEL greater than 65.
Zone C Normally Incompatible	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.
Zone D Clearly Incompatible	New construction of development should generally not be undertaken.

EXHIBIT 3-B: INTERIOR AND EXTERIOR NOISE STANDARDS

Land Use Categories		Energy Average CNEL	
Categories	Uses	Interior[1]	Exterior[2]
RESIDENTIAL	Single Family, Duplex, Multiple Family	45[3]	65
	Mobile Home	NA	65[4]
COMMERCIAL INDUSTRIAL INSTITUTIONAL	Hotel, Motel, Transient Lodging	45	65[5]
	Commercial Retail, Bank, Restaurant	55	NA
	Office Building, Research and Development, Professional Offices, City Office Building	50	NA
	Amphitheatre, Concert Hall Auditorium, Meeting Hall	45	NA
	Gymnasium (Multipurpose)	50	NA
	Sports Club	55	NA
	Manufacturing, Warehousing, Wholesale, Utilities	65	NA
	Movie Theatres	45	NA
INSTITUTIONAL	Hospital, Schools' classroom	45	65
	Church, Library	45	NA
OPEN SPACE	Parks	NA	65

INTERPRETATION

1. Indoor environment excluding bathrooms, toilets, closets, corridors.
2. Outdoor environment limited to:
   - Private yard of single family
   - Multi-family private patio or balcony that is served by a means of exit from inside
   - Mobile home park
   - Hospital patio
   - Park's picnic area
   - School's playground
   - Hotel and motel recreation area
3. Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided as of Chapter 12, Section 1205 of UBC.
4. Exterior noise level should be such that interior noise level will not exceed 45 CNEL
5. Except those areas affected by aircraft noise.

3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Bedford Marketplace, operational source noise such as roof-top air conditioning units, drive-thru speakerphones, trash enclosures, parking lots, gas station activity, car wash tunnel, car wash vacuums, and outdoor playground activity are typically evaluated against standards established under a City's Municipal Code.

3.4.1 CITY OF CORONA OPERATIONAL NOISE STANDARDS

The City of Corona Municipal Code, Section 17.84.040 *Noise*, provides noise control guidelines for determining and mitigating non-transportation or stationary-source noise impacts from operations at private properties. The City of Corona Municipal Code defines *Stationary Noise Source Standards* in Section 17.84.040(C)(2), Table 1, for different land uses. For noise-sensitive residential properties, the Municipal Code identifies operational noise level limits for the daytime (7:00 a.m. to 10:00 p.m.) hours of 55 dBA L_{50} and 50 dBA L_{50} during the nighttime (10:00 p.m. to 7:00 a.m.) hours. (11) These standards shall apply for a cumulative period of 30 minutes in any hour, as well as plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes in any

hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute in any hour, or the standard plus 20 dBA for any period of time. The City of Corona Municipal Code noise standards are shown on Table 3-1 and included in Appendix 3.1.

TABLE 3-1: OPERATIONAL NOISE STANDARDS

Jurisdiction	Land Use	Time Period	Exterior Noise Level Standards (dBA Leq)[2]				
			L_{50} (30 mins)	L_{25} (15 mins)	L_8 (5 mins)	L_2 (1 min)	L_{max} (Anytime)
City of Corona[1]	Residential	Daytime	55.0	60.0	65.0	70.0	75.0
		Nighttime	50.0	55.0	60.0	65.0	70.0

[1] Source: City of Corona Municipal Code, Section 17.84.040 Noise (Appendix 3.1).
[2] The percent noise level is the level exceeded "n" percent of the time during the measurement period. L25 is the noise level exceeded 25% of the time.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Bedford Marketplace, noise from construction activities are typically evaluated against standards established under a City's Municipal Code. The construction-related noise standards for the City are summarized in Table 3-2.

3.5.1 CITY OF CORONA CONSTRUCTION NOISE STANDARDS

Section 17.84.040(D)(2) of the City of Corona Municipal Code, provided in Appendix 3.1, indicates that construction noise is prohibited between the hours of 8:00 p.m. to 7:00 a.m., Monday through Saturday and 6:00 p.m. to 10:00 a.m. on Sundays and federal holidays. (11) Construction noise is defined as noise which is disturbing, excessive or offensive and constitutes a nuisance involving discomfort or annoyance to persons of normal sensitivity residing in the area, which is generated by the use of any tools, machinery or equipment used in connection with construction operations. The City of Corona Municipal Code effectively considers construction noise as exempt if construction noise is limited to the permitted hours of activity.

However, neither the General Plan nor Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*. To allow for a quantified determination of what the City of Corona Municipal Code constitutes as noise that *may be detrimental to the public health, safety or general welfare* due to Project construction activity, relevant stationary source noise standards established in Section 17.84.040(C)(2) Table 1, are used in this analysis to assess the Project construction noise levels at nearby sensitive receivers. Section 17.84.040(C)(2) Table 1 establishes a maximum allowable exterior noise level standard for residential land use of 55 dBA L_{50} for a cumulative period of more 30 minutes in any hour. This same noise standard limits the exterior noise levels to the noise standard (55 dBA) plus 20 dBA for any period of time. This effectively limits the maximum noise

level to 75 dBA L_{max} as shown on Table 3-1. Therefore, consistent with the City of Corona Municipal Code, an exterior noise level of 75 dBA L_{max} is used to describe the maximum acceptable threshold for determining the impacts due to Project construction for sensitive receivers. The City of Corona construction noise standards are shown on Table 3-2 and included in Appendix 3.1.

TABLE 3-2: CONSTRUCTION NOISE STANDARDS

Jurisdiction	Permitted Hours of Construction Activity	Construction Noise Level Standard
City of Corona[1]	7:00 a.m. to 8:00 p.m. Monday to Saturday; 10:00 a.m. to 6:00 p.m. on Sundays & Holidays.	75 dBA L_{max}

[1] Source: City of Corona Municipal Code, Section 17.84.040(D)(2) (Appendix 3.1).
[2] Acceptable construction noise threshold based on the maximum stationary source noise level standards shown on Table 3-1.

3.6 CONSTRUCTION VIBRATION STANDARDS

To analyze the vibration impacts originating from the construction of the Project, vibration from construction activities are typically evaluated against standards established under a City's Municipal Code.

3.6.1 CITY OF CORONA VIBRATION STANDARDS

The City of Corona Municipal Code, Section 17.84.050, identifies a vibration velocity standard of 0.05 in/sec root-mean-square (RMS) for sensitive land uses which is used in this analysis as the basis for determining the relative significance of potential Project related vibration impacts. (11) The City of Corona vibration standards are shown on Table 3-3 and included in Appendix 3.1.

3.6.2 HUMAN PERCEPTION OF VIBRATION

Typically, the human response at the perception threshold for vibration includes annoyance in residential areas as previously shown on Exhibit 2-B, when vibration levels expressed in vibration decibels (VdB) approach 75 VdB. The City of Corona, however, identifies a vibration perception threshold of 0.05 in/sec at or beyond the property line of the source land use. For vibration levels expressed in velocity, the human body responds to the average vibration amplitude often described as the root-mean-square (RMS). The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a one-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to reduce the range of numbers used to describe human response to vibration. Therefore, the City of Corona vibration standard of 0.05 in/sec in RMS velocity levels is used in this analysis to assess the human perception of vibration levels due to Project-related construction activities.

TABLE 3-3: CONSTRUCTION VIBRATION STANDARDS

Jurisdiction	Root-Mean-Square Velocity Standard (in/sec)
City of Corona[1]	0.05

[1] Source: City of Corona Municipal Code, Section 17.84.050 Vibration (Appendix 3.1).

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. (2) 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 Corona General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts, 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 located roughly 6.5 miles southeast of Corona Municipal Airport. Therefore, the Project site is not located within two miles of a public airport or the vicinity of a private airstrip, and as such, no impact related to the exposure of people residing or working in the Project area to excessive airport related noise levels is anticipated.

4.2 PROJECT RELATED NOISE LEVEL INCREASES

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.* (12) 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) (13) 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 2008 California Court of Appeal ruling on Gray v. County of Madera. (12) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

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

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

Federal Interagency Committee on Noise (FICON), 1992.

4.3 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. The significance criteria are shown on Table 4-2.

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).

ON-SITE TRAFFIC NOISE

- If the on-site exterior noise levels exceed 65 dBA CNEL at the outdoor pool area of the hotel use. Interior noise levels shall not exceed 45 dBA CNEL for hotel uses and 55 dBA CNEL for all other commercial uses consistent with the General Plan Public Health and Safety Element interior and exterior noise standards. (See Exhibit 3-B).

OPERATIONAL NOISE

- If Project-related operational (stationary-source) noise levels:
    - exceed the exterior 55 dBA L_{50} daytime or 50 dBA L_{50} nighttime noise level standards for sensitive residential land uses. These standards shall not be exceeded for a cumulative period of 30 minutes (L_{50}), or plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes (L_{25}) in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes (L_8) in any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute (L_2) in any hour, or the standard plus 20 dBA at any time (L_{max}) (City of Corona Municipal Code, Section 17.84.040).
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
    - are less than 60 dBA L_{50} and the Project creates a readily perceptible 5 dBA L_{50} or greater Project-related noise level increase; or
    - range from 60 to 65 dBA L_{50} and the Project creates a barely perceptible 3 dBA L_{50} or greater Project-related noise level increase; or
    - already exceed 65 dBA L_{50}, and the Project creates a community noise level increase of greater than 1.5 dBA L_{50} (FICON, 1992).

CONSTRUCTION NOISE

- If Project-related construction activities:
    - occur at any time other than between the permitted the hours of 7:00 a.m. and 8:00 p.m., Monday through Saturday, and 10:00 a.m. and 6:00 p.m. on Sundays and Federal holidays (City of Corona Municipal Code Section 17.84.040(D)(2)); or
    - create noise levels at sensitive residential receivers in the which exceed the short-term construction noise level limit of 75 dBA L_{max} (City of Corona Municipal Code Section 17.84.040).

CONSTRUCTION VIBRATION

- If short-term Project generated construction source vibration levels exceed the City of Corona maximum acceptable vibration standard of 0.05 in/sec at noise-sensitive receiver locations (City of Corona Municipal Code Section 17.84.050).

TABLE 4-2: 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	
On-Site Traffic[2]	Hotel	Exterior Noise Level Standard	65 dBA CNEL (hotel pool)	
		Interior Noise Level Standard	45 dBA CNEL	
	Commercial	Exterior Noise Level Standard	n/a	
		Interior Noise Level Standard	55 dBA CNEL	
Operational	Noise-Sensitive	Exterior Noise Level Standards[3]	See Table 3-1.	
Construction	Noise-Sensitive	Noise Level Threshold[3]	75 dBA L_{max}	n/a
		Vibration Level Threshold[4]	0.05 in/sec RMS	n/a

[1] Source: FICON, 1992.
[2] Source: Public Health & Safety Element Interior and Exterior Noise Standards (Exhibit 3-B).
[3] Source: City of Corona Municipal Code, Section 17.84.040 Noise (Appendix 3.1).
[4] Source: City of Corona Municipal Code, Section 17.84.050 Vibration (Appendix 3.1).
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.; "n/a" = No nighttime construction activity is permitted, so no nighttime construction noise level limits are identified; "RMS" = root-mean-square

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at four 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 Friday, August 2nd, 2019. 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. (14)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (3) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (15)

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. (15) 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 northwest of Project site on Eagle Glen Parkway and Bedford Canyon Road near existing residential homes. The noise levels at this location consist primarily of traffic noise from Glen Eagle Parkway and Bedford Canyon Road. The noise level measurements collected show an overall 24-hour exterior noise level of 71.4 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 67.3 dBA L_{eq} with an average nighttime noise level of 63.9 dBA L_{eq}.
- Location L2 represents the noise levels west of the Project site near existing vacant dirt lot. The ambient noise levels at this location account for the background traffic from Glen Eagle Parkway and Interstate 15 Freeway. The noise level measurements collected show an overall 24-hour exterior noise level of 62.7 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 57.3 dBA L_{eq} with an average nighttime noise level of 55.8 dBA L_{eq}.
- Location L3 represents the noise levels South of the project site on Glen Road and North Weirick Road near vacant land and existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 59.0 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 53.3 dBA L_{eq} with an average nighttime noise level of 52.1 dBA L_{eq}. The noise levels at this location consist primarily of traffic noise from North Weirick Road and Glen Road.
- Location L4 represents the noise levels southeast of the Project site on Glen Road near existing residential homes and vacant lot. The 24-hour CNEL indicates that the overall exterior noise level is 55.9 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 49.6 dBA L_{eq} with an average nighttime noise level of 49.2 dBA L_{eq}. Traffic on Glen Road represents the primary source of noise at this location.

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

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with surface streets as well as Interstate 15. This includes the auto and heavy truck activities on study area roadway segments near the noise level measurement locations. 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]		Median Noise Level (dBA L_{50})[2]		CNEL
		Daytime	Nighttime	Daytime	Nighttime	
L1	Located northwest of Project site on Eagle Glen Parkway and Bedford Canyon Road near existing residential homes.	67.3	63.9	60.2	53.7	71.4
L2	Located west of the Project site near existing vacant dirt lot.	57.3	55.8	54.4	52.1	62.7
L3	Located South of the project site on Glen Road and North Weirick Road near vacant land and existing residential homes.	53.3	52.1	52.0	50.8	59.0
L4	Located southeast of the Project site on Glen Road near existing residential homes and vacant lot.	49.6	49.2	47.7	47.7	55.9

[1] See Exhibit 5-A for the noise level measurement locations.
[2] 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

LEGEND:

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. (16) 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. (17) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (18)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the 21 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Corona General Plan Circulation Element, and the posted vehicle speeds. For the purpose of the off-site analysis, soft site conditions were used to analyze the traffic noise impacts for the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation.

6.2.1 PROJECT TRAFFIC

The Existing, Interim Year 2021, and Horizon Year 2035 average daily traffic volumes used for this study are presented on Table 6-2 and are provided by *Bedford Marketplace Traffic Study*. (1) 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	Adjacent Planned (Existing if Different) Land Use[1]	Distance from Centerline to Nearest Adjacent Land Use (Feet)[2]	Vehicle Speed (mph)
1	Masters Dr.	n/o California Av.	Residential	34'	40
2	Masters Dr.	s/o California Av.	Residential	34'	40
3	Masters Dr.	n/o Bennet Av.	Residential	34'	40
4	Masters Dr.	n/o Eagle Glen Pkwy.	Residential	34'	40
5	Bedford Cyn. Rd.	s/o El Cerrito Rd.	Residential	38'	40
6	Bedford Cyn. Rd.	n/o Georgetown Dr.	Residential	38'	40
7	Bedford Cyn. Rd.	n/o Eagle Glen Pkwy.	Residential	38'	40
8	Temescal Cyn. Rd.	n/o Cajalco Rd.	General Commercial	53'	45
9	Temescal Cyn. Rd.	s/o Cajalco Rd.	Agriculture	53'	45
10	California Av.	w/o Masters Dr.	General Commercial	34'	40
11	California Av.	e/o Masters Dr.	General Commercial	34'	40
12	El Cerrito Rd.	w/o Bedford Cyn. Rd.	General Industry	44'	40
13	El Cerrito Rd.	e/o Bedford Cyn. Rd.	Residential	44'	40
14	El Cerrito Rd.	e/o I-15 SB Ramps	Freeway	44'	40
15	El Cerrito Rd.	e/o I-15 NB Ramps	Residential	44'	40
16	Eagle Glen Pkwy.	e/o Masters Dr.	Residential	44'	40
17	Eagle Glen Pkwy.	e/o Bedford Cyn. Rd.	Open Space	65'	45
18	Cajalco Rd.	e/o I-15 SB Ramps	General Commercial	65'	45
19	Cajalco Rd.	e/o I-15 NB Ramps	General Commercial	65'	45
20	Cajalco Rd.	e/o Grand Oaks	General Commercial	65'	45
21	Cajalco Rd.	e/o Temescal Cyn. Rd.	General Commercial	65'	45

[1] Sources: City of Corona General Plan Atlas, 2012, and the County of Riverside Temescal Canyon Area Land Use Plan, 2003.
[2] Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the City of Corona General Plan Circulation Element.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]					
			Existing		Interim Year 2021		Horizon Year 2035	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Masters Dr.	n/o California Av.	4,452	4,682	5,049	5,069	8,000	8,250
2	Masters Dr.	s/o California Av.	9,364	9,364	10,071	10,153	8,800	9,668
3	Masters Dr.	n/o Bennet Av.	6,000	7,084	7,578	7,784	6,400	7,690
4	Masters Dr.	n/o Eagle Glen Pkwy.	5,466	6,648	7,098	7,346	6,100	7,532
5	Bedford Cyn. Rd.	s/o El Cerrito Rd.	7,800	9,490	10,133	10,401	14,500	16,458
6	Bedford Cyn. Rd.	n/o Georgetown Dr.	8,926	8,926	9,522	9,790	14,500	16,458
7	Bedford Cyn. Rd.	n/o Eagle Glen Pkwy.	8,088	9,876	10,542	10,852	14,200	16,298
8	Temescal Cyn. Rd.	n/o Cajalco Rd.	15,599	15,883	17,168	17,230	26,500	26,846
9	Temescal Cyn. Rd.	s/o Cajalco Rd.	21,684	22,242	24,029	24,091	21,000	28,448
10	California Av.	w/o Masters Dr.	5,244	5,480	5,912	5,954	8,300	8,578
11	California Av.	e/o Masters Dr.	7,000	7,320	7,897	7,917	10,800	11,140
12	El Cerrito Rd.	w/o Bedford Cyn. Rd.	24,043	25,127	27,108	27,294	29,000	30,270
13	El Cerrito Rd.	e/o Bedford Cyn. Rd.	25,534	26,140	28,244	28,326	35,100	35,788
14	El Cerrito Rd.	e/o I-15 SB Ramps	16,374	16,980	18,329	18,411	27,100	27,788
15	El Cerrito Rd.	e/o I-15 NB Ramps	9,519	10,125	10,909	10,991	17,200	17,888
16	Eagle Glen Pkwy.	e/o Masters Dr.	12,944	19,794	20,861	21,109	17,300	24,398
17	Eagle Glen Pkwy.	e/o Bedford Cyn. Rd.	18,480	33,686	35,209	36,713	20,600	37,310
18	Cajalco Rd.	e/o I-15 SB Ramps	20,220	29,005	30,671	31,546	24,900	34,560
19	Cajalco Rd.	e/o I-15 NB Ramps	30,314	32,680	35,178	35,426	30,700	33,314
20	Cajalco Rd.	e/o Grand Oaks	18,024	19,980	21,465	21,713	19,000	21,204
21	Cajalco Rd.	e/o Temescal Cyn. Rd.	20,076	21,190	22,844	22,968	30,000	31,238

[1] Source: Bedford Marketplace Traffic Study, Urban Crossroads, Inc.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	77.5%	12.9%	9.6%	100.00%
Medium Trucks	84.8%	4.9%	10.3%	100.00%
Heavy Trucks	86.5%	2.7%	10.8%	100.00%

[1] Source: Arantine Hills Modified Project Noise Impact Analysis, Urban Crossroads, Inc. April 9, 2015.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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

Roadway	Total % Traffic Flow[1]			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	97.42%	1.84%	0.74%	100.00%
I-15 Freeway	94.39%	1.95%	3.66%	100.00%

[1] Source: Arantine Hills Modified Project Noise Impact Analysis, Urban Crossroads, Inc. April 9, 2015.
[2] Source: Caltrans Traffic Data Branch Annual Average Daily Truck Traffic (AADT) on the California State Highway System, 2013.

6.2.2 SOIL IMPORT/EXPORT HAUL TRUCK TRAFFIC

The Existing and Existing with Project (haul truck trips) average daily traffic volumes used for the soil import/export off-site traffic noise analysis are presented on Table 6-5. The without project average daily traffic volumes shown on Table 6-5 are based the published City of Corona average daily traffic volumes and the Kearny Sherborn Traffic Study prepared by Urban Crossroads, Inc. The with Project haul truck trips include both the 250 import and 250 export trips representing a total of 500 two-way (import and export) trips.

TABLE 6-5: SOIL IMPORT/EXPORT HAUL TRUCK AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Adjacent Existing Land Use	Average Daily Traffic Volumes[1]	
				Without Project[1]	With Project Haul Truck Trips
1	I-15 Freeway	n/o Cajalco Rd.	Residential/Commercial	164,000	164,500
2	Magnolia Ave.	e/o I-15 Freeway	Commercial/Industrial	40,000	40,500
3	Sherborn St.	s/o Magnolia Ave.	Commercial/Industrial	7,900	8,400

[1] Source: City of Corona Average Daily Traffic Volumes (5/30/2017) and Kearny Sherborn Traffic Study (7/25/2019).

To quantify the off-site traffic noise levels, the Project related haul trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project related haul trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix. Table 6-6 presents the without project traffic flow distribution by vehicle type.

TABLE 6-6: WITHOUT SOIL IMPORT/EXHPORT HAUL TRUCK TRIPS (VEHICLE MIX)

ID	Roadway	Segment	Total % Traffic Flow			Total
			Autos	Medium Trucks	Heavy Trucks	
1	I-15 Freeway	n/o Cajalco Rd.	94.39%	1.95%	3.66%	100%
2	Magnolia Ave.	e/o I-15 Freeway	97.42%	1.84%	0.74%	100%
3	Sherborn St.	s/o Magnolia Ave.	97.42%	1.84%	0.74%	100%

Table 6-7 presents the with project haul trips traffic flow distribution by vehicle type. As shown on Table 6-7, all the off-site roadway segments have a higher percentage of heavy trucks reflecting the additional haul heavy truck trips.

TABLE 6-7: WITH SOIL IMPORT/EXHPORT HAUL TRUCK TRIPS (VEHICLE MIX)

ID	Roadway	Segment	Total % Traffic Flow			Total
			Autos	Medium Trucks	Heavy Trucks	
1	I-15 Freeway	n/o Cajalco Rd.	94.10%	1.94%	3.95%	100%
2	Magnolia Ave.	e/o I-15 Freeway	96.25%	1.82%	1.93%	100%
3	Sherborn St.	s/o Magnolia Ave.	91.09%	1.72%	7.19%	100%

6.3 ON-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

The on-site roadway parameters including the average daily traffic (ADT) volumes used for this study are presented on Table 6-8. The traffic volumes shown on Table 6-5 reflect future long-range traffic conditions needed to assess the future on-site traffic noise environment and to identify the any noise mitigation measures to address the worst-case future conditions. For the purposes of this analysis, soft site conditions were used to analyze the on-site traffic noise impacts for the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation.

TABLE 6-8: ON-SITE ROADWAY PARAMETERS

Roadway Segment	Lanes	Classification	Traffic Volume[1]	Speed (MPH)	Site Conditions
I-15 Freeway s/o Cajalco Rd.	6	Freeway	198,280	65	Soft

[1] Source: Arantine Hills Modified Project Traffic Study (March 2015).

The site plan was used to identify the relationship between the roadway centerline elevation, the pad elevation and the centerline distance to the noise barrier, and the building façade. The exterior noise level impacts at the outdoor pool area of the hotel use were placed five feet above the pad elevation. The second floor receivers were located 15 feet above the proposed finished floor elevation, all third floor receivers were located 25 feet above the proposed finished floor elevation and all fourth floor receiver were located 35 feet above the proposed finished floor elevation.

6.4 VIBRATION ASSESSMENT

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

While vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-9. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 6-9: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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

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

7 OFF-SITE TRAFFIC NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with development of the proposed Project, noise contours were developed based on *Bedford Marketplace Traffic Study*. (1) The off-site traffic noise analysis has been completed to determine the noise impacts associated with the development of the proposed Bedford Marketplace ("Project") an expansion of the previously approved commercial development area included within the Arantine Hills Specific Plan. The proposed Project represents the expansion of Bedford Marketplace from 80,000 sf to 135,000 sf of retail uses and a 135-room hotel. The incremental expansion of Bedford Marketplace constitutes the "Project" analyzed in this study. Based on the currently approved commercial trip generation in the Arantine Hills Traffic Assessment (November 2018), the Project is anticipated to generate an additional 2,061 external trips per day.

Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

PROJECT TRAFFIC

- Existing Without / With Project: This scenario refers to the existing present-day noise conditions, without and with the proposed Project. This condition is provided solely for analytical purposes and will not occur, since the Project will not be fully developed and occupied under Existing conditions.
- Interim Year 2021 Without / With Project: This scenario refers to the combination of existing traffic, ambient growth (total of 8%), approved Arantine Hills Specific Plan traffic, and increases in traffic volumes associated with the added Project land uses. The approved Arantine Hills Project traffic is also included as background traffic for Interim Year 2021 conditions.
- Horizon Year 2035 Without / With Project: This scenario refers the horizon year 2035 forecasts are derived from the approved Arantine Hills Specific Plan Traffic Assessment (November 2018).

SOIL IMPORT/EXPORT HAUL TRUCK CONSTRUCTION TRAFFIC

- Existing Without / With Project: This scenario refers to the existing present-day noise conditions with the proposed 500 daily soil import/export truck haul trips.

7.1 PROJECT TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 and 7-6 present a summary of the exterior traffic noise levels, without barrier attenuation, for the study area roadway segments analyzed from the without Project to the with

Project conditions for Existing, Interim Year 2021, and Horizon Year 2035 conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Masters Dr.	n/o California Av.	Residential	64.3	RW	RW	66
2	Masters Dr.	s/o California Av.	Residential	67.5	RW	50	108
3	Masters Dr.	n/o Bennet Av.	Residential	65.6	RW	37	80
4	Masters Dr.	n/o Eagle Glen Pkwy.	Residential	65.2	RW	35	75
5	Bedford Cyn. Rd.	s/o El Cerrito Rd.	Residential	66.2	RW	46	98
6	Bedford Cyn. Rd.	n/o Georgetown Dr.	Residential	66.8	RW	50	108
7	Bedford Cyn. Rd.	n/o Eagle Glen Pkwy.	Residential	66.4	RW	47	101
8	Temescal Cyn. Rd.	n/o Cajalco Rd.	General Commercial	68.8	RW	96	206
9	Temescal Cyn. Rd.	s/o Cajalco Rd.	Agriculture	70.3	55	119	257
10	California Av.	w/o Masters Dr.	General Commercial	65.0	RW	34	73
11	California Av.	e/o Masters Dr.	General Commercial	66.2	RW	41	89
12	El Cerrito Rd.	w/o Bedford Cyn. Rd.	General Industry	70.4	47	101	217
13	El Cerrito Rd.	e/o Bedford Cyn. Rd.	Residential	70.7	49	105	226
14	El Cerrito Rd.	e/o I-15 SB Ramps	Freeway	68.7	RW	78	168
15	El Cerrito Rd.	e/o I-15 NB Ramps	Residential	66.4	RW	54	117
16	Eagle Glen Pkwy.	e/o Masters Dr.	Residential	67.7	RW	67	144
17	Eagle Glen Pkwy.	e/o Bedford Cyn. Rd.	Open Space	68.8	RW	116	250
18	Cajalco Rd.	e/o I-15 SB Ramps	General Commercial	69.2	RW	123	265
19	Cajalco Rd.	e/o I-15 NB Ramps	General Commercial	70.9	75	161	347
20	Cajalco Rd.	e/o Grand Oaks	General Commercial	68.7	RW	114	246
21	Cajalco Rd.	e/o Temescal Cyn. Rd.	General Commercial	69.1	RW	122	264

[1] Sources: City of Corona General Plan Atlas, January 2012, and the County of Riverside Temescal Canyon Area Land Use Plan

[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not represent a paved and/or fully constructed roadway under the given scenario.

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Masters Dr.	n/o California Av.	Residential	64.5	RW	RW	68
2	Masters Dr.	s/o California Av.	Residential	67.5	RW	50	108
3	Masters Dr.	n/o Bennet Av.	Residential	66.3	RW	42	89
4	Masters Dr.	n/o Eagle Glen Pkwy.	Residential	66.0	RW	40	86
5	Bedford Cyn. Rd.	s/o El Cerrito Rd.	Residential	67.1	RW	52	112
6	Bedford Cyn. Rd.	n/o Georgetown Dr.	Residential	66.8	RW	50	108
7	Bedford Cyn. Rd.	n/o Eagle Glen Pkwy.	Residential	67.2	RW	53	115
8	Temescal Cyn. Rd.	n/o Cajalco Rd.	General Commercial	68.9	RW	97	209
9	Temescal Cyn. Rd.	s/o Cajalco Rd.	Agriculture	70.4	56	121	261
10	California Av.	w/o Masters Dr.	General Commercial	65.2	RW	35	75
11	California Av.	e/o Masters Dr.	General Commercial	66.4	RW	42	91
12	El Cerrito Rd.	w/o Bedford Cyn. Rd.	General Industry	70.6	48	104	224
13	El Cerrito Rd.	e/o Bedford Cyn. Rd.	Residential	70.8	49	107	230
14	El Cerrito Rd.	e/o I-15 SB Ramps	Freeway	68.9	RW	80	172
15	El Cerrito Rd.	e/o I-15 NB Ramps	Residential	66.6	RW	57	122
16	Eagle Glen Pkwy.	e/o Masters Dr.	Residential	69.6	RW	89	191
17	Eagle Glen Pkwy.	e/o Bedford Cyn. Rd.	Open Space	71.4	80	173	373
18	Cajalco Rd.	e/o I-15 SB Ramps	General Commercial	70.7	73	157	337
19	Cajalco Rd.	e/o I-15 NB Ramps	General Commercial	71.2	79	169	365
20	Cajalco Rd.	e/o Grand Oaks	General Commercial	69.1	RW	122	263
21	Cajalco Rd.	e/o Temescal Cyn. Rd.	General Commercial	69.4	RW	127	274

[1] Sources: City of Corona General Plan Atlas, January 2012, and the County of Riverside Temescal Canyon Area Land Use Plan.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not represent a paved and/or fully constructed roadway under the given scenario.

TABLE 7-3: INTERIM YEAR 2021 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Masters Dr.	n/o California Av.	Residential	64.8	RW	RW	71
2	Masters Dr.	s/o California Av.	Residential	67.8	RW	52	113
3	Masters Dr.	n/o Bennet Av.	Residential	66.6	RW	43	94
4	Masters Dr.	n/o Eagle Glen Pkwy.	Residential	66.3	RW	42	90
5	Bedford Cyn. Rd.	s/o El Cerrito Rd.	Residential	67.3	RW	54	117
6	Bedford Cyn. Rd.	n/o Georgetown Dr.	Residential	67.1	RW	52	112
7	Bedford Cyn. Rd.	n/o Eagle Glen Pkwy.	Residential	67.5	RW	56	120
8	Temescal Cyn. Rd.	n/o Cajalco Rd.	General Commercial	69.3	RW	102	220
9	Temescal Cyn. Rd.	s/o Cajalco Rd.	Agriculture	70.7	59	128	275
10	California Av.	w/o Masters Dr.	General Commercial	65.5	RW	37	79
11	California Av.	e/o Masters Dr.	General Commercial	66.8	RW	45	96
12	El Cerrito Rd.	w/o Bedford Cyn. Rd.	General Industry	70.9	51	109	235
13	El Cerrito Rd.	e/o Bedford Cyn. Rd.	Residential	71.1	52	112	242
14	El Cerrito Rd.	e/o I-15 SB Ramps	Freeway	69.2	RW	84	181
15	El Cerrito Rd.	e/o I-15 NB Ramps	Residential	67.0	RW	60	128
16	Eagle Glen Pkwy.	e/o Masters Dr.	Residential	69.8	RW	92	198
17	Eagle Glen Pkwy.	e/o Bedford Cyn. Rd.	Open Space	71.6	83	178	384
18	Cajalco Rd.	e/o I-15 SB Ramps	General Commercial	71.0	75	162	350
19	Cajalco Rd.	e/o I-15 NB Ramps	General Commercial	71.6	83	178	383
20	Cajalco Rd.	e/o Grand Oaks	General Commercial	69.4	RW	128	276
21	Cajalco Rd.	e/o Temescal Cyn. Rd.	General Commercial	69.7	RW	133	288

[1] Sources: City of Corona General Plan Atlas, January 2012, and the County of Riverside Temescal Canyon Area Land Use Plan.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not represent a paved and/or fully constructed roadway under the given scenario.

TABLE 7-4: INTERIM YEAR 2021 WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Masters Dr.	n/o California Av.	Residential	64.8	RW	RW	72
2	Masters Dr.	s/o California Av.	Residential	67.9	RW	53	114
3	Masters Dr.	n/o Bennet Av.	Residential	66.7	RW	44	95
4	Masters Dr.	n/o Eagle Glen Pkwy.	Residential	66.5	RW	43	92
5	Bedford Cyn. Rd.	s/o El Cerrito Rd.	Residential	67.5	RW	55	119
6	Bedford Cyn. Rd.	n/o Georgetown Dr.	Residential	67.2	RW	53	115
7	Bedford Cyn. Rd.	n/o Eagle Glen Pkwy.	Residential	67.6	RW	57	123
8	Temescal Cyn. Rd.	n/o Cajalco Rd.	General Commercial	69.3	RW	102	220
9	Temescal Cyn. Rd.	s/o Cajalco Rd.	Agriculture	70.7	59	128	275
10	California Av.	w/o Masters Dr.	General Commercial	65.5	RW	37	80
11	California Av.	e/o Masters Dr.	General Commercial	66.8	RW	45	96
12	El Cerrito Rd.	w/o Bedford Cyn. Rd.	General Industry	71.0	51	110	236
13	El Cerrito Rd.	e/o Bedford Cyn. Rd.	Residential	71.1	52	112	242
14	El Cerrito Rd.	e/o I-15 SB Ramps	Freeway	69.2	RW	84	182
15	El Cerrito Rd.	e/o I-15 NB Ramps	Residential	67.0	RW	60	129
16	Eagle Glen Pkwy.	e/o Masters Dr.	Residential	69.8	RW	92	199
17	Eagle Glen Pkwy.	e/o Bedford Cyn. Rd.	Open Space	71.7	85	183	395
18	Cajalco Rd.	e/o I-15 SB Ramps	General Commercial	71.1	77	166	357
19	Cajalco Rd.	e/o I-15 NB Ramps	General Commercial	71.6	83	179	385
20	Cajalco Rd.	e/o Grand Oaks	General Commercial	69.5	RW	129	278
21	Cajalco Rd.	e/o Temescal Cyn. Rd.	General Commercial	69.7	RW	134	289

[1] Sources: City of Corona General Plan Atlas, January 2012, and the County of Riverside Temescal Canyon Area Land Use Plan.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not represent a paved and/or fully constructed roadway under the given scenario.

TABLE 7-5: HORIZON YEAR 2035 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Masters Dr.	n/o California Av.	Residential	66.8	RW	45	97
2	Masters Dr.	s/o California Av.	Residential	67.2	RW	48	103
3	Masters Dr.	n/o Bennet Av.	Residential	65.9	RW	39	84
4	Masters Dr.	n/o Eagle Glen Pkwy.	Residential	65.6	RW	38	81
5	Bedford Cyn. Rd.	s/o El Cerrito Rd.	Residential	68.9	RW	69	149
6	Bedford Cyn. Rd.	n/o Georgetown Dr.	Residential	68.9	RW	69	149
7	Bedford Cyn. Rd.	n/o Eagle Glen Pkwy.	Residential	68.8	RW	68	147
8	Temescal Cyn. Rd.	n/o Cajalco Rd.	General Commercial	71.2	63	136	294
9	Temescal Cyn. Rd.	s/o Cajalco Rd.	Agriculture	70.1	54	117	251
10	California Av.	w/o Masters Dr.	General Commercial	67.0	RW	46	99
11	California Av.	e/o Masters Dr.	General Commercial	68.1	RW	55	118
12	El Cerrito Rd.	w/o Bedford Cyn. Rd.	General Industry	71.2	53	114	246
13	El Cerrito Rd.	e/o Bedford Cyn. Rd.	Residential	72.0	60	130	279
14	El Cerrito Rd.	e/o I-15 SB Ramps	Freeway	70.9	51	109	235
15	El Cerrito Rd.	e/o I-15 NB Ramps	Residential	68.9	RW	81	174
16	Eagle Glen Pkwy.	e/o Masters Dr.	Residential	69.0	RW	81	174
17	Eagle Glen Pkwy.	e/o Bedford Cyn. Rd.	Open Space	69.2	RW	125	268
18	Cajalco Rd.	e/o I-15 SB Ramps	General Commercial	70.1	66	141	305
19	Cajalco Rd.	e/o I-15 NB Ramps	General Commercial	71.0	75	163	350
20	Cajalco Rd.	e/o Grand Oaks	General Commercial	68.9	RW	118	254
21	Cajalco Rd.	e/o Temescal Cyn. Rd.	General Commercial	70.9	74	160	345

[1] Sources: City of Corona General Plan Atlas, January 2012, and the County of Riverside Temescal Canyon Area Land Use Plan.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not represent a paved and/or fully constructed roadway under the given scenario.

TABLE 7-6: HORIZON YEAR 2035 WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Masters Dr.	n/o California Av.	Residential	67.0	RW	46	99
2	Masters Dr.	s/o California Av.	Residential	67.7	RW	51	110
3	Masters Dr.	n/o Bennet Av.	Residential	66.7	RW	44	94
4	Masters Dr.	n/o Eagle Glen Pkwy.	Residential	66.6	RW	43	93
5	Bedford Cyn. Rd.	s/o El Cerrito Rd.	Residential	69.4	RW	75	162
6	Bedford Cyn. Rd.	n/o Georgetown Dr.	Residential	69.4	RW	75	162
7	Bedford Cyn. Rd.	n/o Eagle Glen Pkwy.	Residential	69.4	RW	75	161
8	Temescal Cyn. Rd.	n/o Cajalco Rd.	General Commercial	71.2	64	137	296
9	Temescal Cyn. Rd.	s/o Cajalco Rd.	Agriculture	71.5	66	143	308
10	California Av.	w/o Masters Dr.	General Commercial	67.1	RW	47	102
11	California Av.	e/o Masters Dr.	General Commercial	68.3	RW	56	121
12	El Cerrito Rd.	w/o Bedford Cyn. Rd.	General Industry	71.4	55	118	253
13	El Cerrito Rd.	e/o Bedford Cyn. Rd.	Residential	72.1	61	131	283
14	El Cerrito Rd.	e/o I-15 SB Ramps	Freeway	71.0	52	111	239
15	El Cerrito Rd.	e/o I-15 NB Ramps	Residential	69.1	RW	83	178
16	Eagle Glen Pkwy.	e/o Masters Dr.	Residential	70.5	47	102	219
17	Eagle Glen Pkwy.	e/o Bedford Cyn. Rd.	Open Space	71.8	86	185	399
18	Cajalco Rd.	e/o I-15 SB Ramps	General Commercial	71.5	82	176	379
19	Cajalco Rd.	e/o I-15 NB Ramps	General Commercial	71.3	80	172	370
20	Cajalco Rd.	e/o Grand Oaks	General Commercial	69.4	RW	127	274
21	Cajalco Rd.	e/o Temescal Cyn. Rd.	General Commercial	71.0	76	164	354

[1] Sources: City of Corona General Plan Atlas, January 2012, and the County of Riverside Temescal Canyon Area Land Use Plan.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not represent a paved and/or fully constructed roadway under the given scenario.

7.2 EXISTING CONDITIONS PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report for informational purposes and to fully analyze all the traffic conditions identified in the *Bedford Marketplace Traffic Study* prepared by Urban Crossroads, Inc. This condition is provided solely for analytical purposes and will not occur, since the Project will not be fully developed and occupied under Existing conditions.

Table 7-1 presents the Existing without Project conditions CNEL noise levels. The without Project exterior noise levels are expected to range from 64.3 to 70.9 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 64.5 to 71.4 dBA CNEL. As shown on Table 7-7 the Project will generate a noise level increase of up to 2.6 dBA CNEL on the study area roadway segments.

7.3 INTERIM YEAR 2021 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-3 presents the Interim Year 2021 without Project conditions CNEL noise levels which are expected to range from 64.8 to 71.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography.

Table 7-4 shows the Interim Year 2021 with Project conditions will range from 64.8 to 71.7 dBA CNEL. As shown on Table 7-8 the Project will generate a noise level increase of up to 0.2 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *less than significant* under Interim Year 2021 with Project conditions at the land uses adjacent to roadways conveying Project traffic.

7.4 HORIZON YEAR 2035 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-5 presents the Horizon Year 2035 without Project conditions CNEL noise levels are expected to range from 65.6 to 72.0 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography.

Table 7-6 shows the Horizon Year 2035 with Project conditions will range from 66.6 to 72.1 dBA CNEL. As shown on Table 7-9 the Project will generate a noise level increase of up to 2.6 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *less than significant* under Horizon Year 2035 with Project conditions at the land uses adjacent to roadways conveying Project traffic.

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

ID	Road	Segment	Adjacent Land Use	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Off-Site Traffic Noise Threshold[2]	Threshold Exceeded?
				No Project	With Project	Project Addition			
1	Masters Dr.	n/o California Av.	Residential	64.3	64.5	0.2	Yes	3.0	No
2	Masters Dr.	s/o California Av.	Residential	67.5	67.5	0.0	Yes	1.5	No
3	Masters Dr.	n/o Bennet Av.	Residential	65.6	66.3	0.7	Yes	1.5	No
4	Masters Dr.	n/o Eagle Glen Pkwy.	Residential	65.2	66.0	0.8	Yes	1.5	No
5	Bedford Cyn. Rd.	s/o El Cerrito Rd.	Residential	66.2	67.1	0.9	Yes	1.5	No
6	Bedford Cyn. Rd.	n/o Georgetown Dr.	Residential	66.8	66.8	0.0	Yes	1.5	No
7	Bedford Cyn. Rd.	n/o Eagle Glen Pkwy.	Residential	66.4	67.2	0.8	Yes	1.5	No
8	Temescal Cyn. Rd.	n/o Cajalco Rd.	General Commercial	68.8	68.9	0.1	No	n/a	No
9	Temescal Cyn. Rd.	s/o Cajalco Rd.	Agriculture	70.3	70.4	0.1	No	n/a	No
10	California Av.	w/o Masters Dr.	General Commercial	65.0	65.2	0.2	No	n/a	No
11	California Av.	e/o Masters Dr.	General Commercial	66.2	66.4	0.2	No	n/a	No
12	El Cerrito Rd.	w/o Bedford Cyn. Rd.	General Industry	70.4	70.6	0.2	No	n/a	No
13	El Cerrito Rd.	e/o Bedford Cyn. Rd.	Residential	70.7	70.8	0.1	Yes	1.5	No
14	El Cerrito Rd.	e/o I-15 SB Ramps	Freeway	68.7	68.9	0.2	No	n/a	No
15	El Cerrito Rd.	e/o I-15 NB Ramps	Residential	66.4	66.6	0.2	Yes	1.5	No
16	Eagle Glen Pkwy.	e/o Masters Dr.	Residential	67.7	69.6	1.9	Yes	1.5	Yes
17	Eagle Glen Pkwy.	e/o Bedford Cyn. Rd.	Open Space	68.8	71.4	2.6	No	n/a	No
18	Cajalco Rd.	e/o I-15 SB Ramps	General Commercial	69.2	70.7	1.5	No	n/a	No
19	Cajalco Rd.	e/o I-15 NB Ramps	General Commercial	70.9	71.2	0.3	No	n/a	No
20	Cajalco Rd.	e/o Grand Oaks	General Commercial	68.7	69.1	0.4	No	n/a	No
21	Cajalco Rd.	e/o Temescal Cyn. Rd.	General Commercial	69.1	69.4	0.3	No	n/a	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] Significance Criteria (Section 4). "n/a" not applicable, adjacent land use is not a noise sensitive.

TABLE 7-8: INTERIM YEAR 2021 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Off-Site Traffic Noise Threshold[2]	Threshold Exceeded?
				No Project	With Project	Project Addition			
1	Masters Dr.	n/o California Av.	Residential	64.8	64.8	0.0	Yes	3.0	No
2	Masters Dr.	s/o California Av.	Residential	67.8	67.9	0.1	Yes	1.5	No
3	Masters Dr.	n/o Bennet Av.	Residential	66.6	66.7	0.1	Yes	1.5	No
4	Masters Dr.	n/o Eagle Glen Pkwy.	Residential	66.3	66.5	0.2	Yes	1.5	No
5	Bedford Cyn. Rd.	s/o El Cerrito Rd.	Residential	67.3	67.5	0.2	Yes	1.5	No
6	Bedford Cyn. Rd.	n/o Georgetown Dr.	Residential	67.1	67.2	0.1	Yes	1.5	No
7	Bedford Cyn. Rd.	n/o Eagle Glen Pkwy.	Residential	67.5	67.6	0.1	Yes	1.5	No
8	Temescal Cyn. Rd.	n/o Cajalco Rd.	General Commercial	69.3	69.3	0.0	No	n/a	No
9	Temescal Cyn. Rd.	s/o Cajalco Rd.	Agriculture	70.7	70.7	0.0	No	n/a	No
10	California Av.	w/o Masters Dr.	General Commercial	65.5	65.5	0.0	No	n/a	No
11	California Av.	e/o Masters Dr.	General Commercial	66.8	66.8	0.0	No	n/a	No
12	El Cerrito Rd.	w/o Bedford Cyn. Rd.	General Industry	70.9	71.0	0.1	No	n/a	No
13	El Cerrito Rd.	e/o Bedford Cyn. Rd.	Residential	71.1	71.1	0.0	Yes	1.5	No
14	El Cerrito Rd.	e/o I-15 SB Ramps	Freeway	69.2	69.2	0.0	No	n/a	No
15	El Cerrito Rd.	e/o I-15 NB Ramps	Residential	67.0	67.0	0.0	Yes	1.5	No
16	Eagle Glen Pkwy.	e/o Masters Dr.	Residential	69.8	69.8	0.0	Yes	1.5	No
17	Eagle Glen Pkwy.	e/o Bedford Cyn. Rd.	Open Space	71.6	71.7	0.1	No	n/a	No
18	Cajalco Rd.	e/o I-15 SB Ramps	General Commercial	71.0	71.1	0.1	No	n/a	No
19	Cajalco Rd.	e/o I-15 NB Ramps	General Commercial	71.6	71.6	0.0	No	n/a	No
20	Cajalco Rd.	e/o Grand Oaks	General Commercial	69.4	69.5	0.1	No	n/a	No
21	Cajalco Rd.	e/o Temescal Cyn. Rd.	General Commercial	69.7	69.7	0.0	No	n/a	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

[2] Significance Criteria (Section 4). "n/a" not applicable, adjacent land use is not a noise sensitive.

TABLE 7-9: HORIZON YEAR 2035 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Off-Site Traffic Noise Threshold[2]	Threshold Exceeded?
				No Project	With Project	Project Addition			
1	Masters Dr.	n/o California Av.	Residential	66.8	67.0	0.2	Yes	1.5	No
2	Masters Dr.	s/o California Av.	Residential	67.2	67.7	0.5	Yes	1.5	No
3	Masters Dr.	n/o Bennet Av.	Residential	65.9	66.7	0.8	Yes	1.5	No
4	Masters Dr.	n/o Eagle Glen Pkwy.	Residential	65.6	66.6	1.0	Yes	1.5	No
5	Bedford Cyn. Rd.	s/o El Cerrito Rd.	Residential	68.9	69.4	0.5	Yes	1.5	No
6	Bedford Cyn. Rd.	n/o Georgetown Dr.	Residential	68.9	69.4	0.5	Yes	1.5	No
7	Bedford Cyn. Rd.	n/o Eagle Glen Pkwy.	Residential	68.8	69.4	0.6	Yes	1.5	No
8	Temescal Cyn. Rd.	n/o Cajalco Rd.	General Commercial	71.2	71.2	0.0	No	n/a	No
9	Temescal Cyn. Rd.	s/o Cajalco Rd.	Agriculture	70.1	71.5	1.4	No	n/a	No
10	California Av.	w/o Masters Dr.	General Commercial	67.0	67.1	0.1	No	n/a	No
11	California Av.	e/o Masters Dr.	General Commercial	68.1	68.3	0.2	No	n/a	No
12	El Cerrito Rd.	w/o Bedford Cyn. Rd.	General Industry	71.2	71.4	0.2	No	n/a	No
13	El Cerrito Rd.	e/o Bedford Cyn. Rd.	Residential	72.0	72.1	0.1	Yes	1.5	No
14	El Cerrito Rd.	e/o I-15 SB Ramps	Freeway	70.9	71.0	0.1	No	n/a	No
15	El Cerrito Rd.	e/o I-15 NB Ramps	Residential	68.9	69.1	0.2	Yes	1.5	No
16	Eagle Glen Pkwy.	e/o Masters Dr.	Residential	69.0	70.5	1.5	Yes	1.5	No
17	Eagle Glen Pkwy.	e/o Bedford Cyn. Rd.	Open Space	69.2	71.8	2.6	No	n/a	No
18	Cajalco Rd.	e/o I-15 SB Ramps	General Commercial	70.1	71.5	1.4	No	n/a	No
19	Cajalco Rd.	e/o I-15 NB Ramps	General Commercial	71.0	71.3	0.3	No	n/a	No
20	Cajalco Rd.	e/o Grand Oaks	General Commercial	68.9	69.4	0.5	No	n/a	No
21	Cajalco Rd.	e/o Temescal Cyn. Rd.	General Commercial	70.9	71.0	0.1	No	n/a	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

[2] Significance Criteria (Section 4). "n/a" not applicable, adjacent land use is not noise sensitive.

7.5 SOIL IMPORT/EXPORT HAUL TRUCK OFF-SITE TRAFFIC ANALYSIS

To bring the Modified Bedford Marketplace Project Site up to an elevation similar (within five feet) of the existing 10-acre commercial pad, import of approximately 440,000 cubic yards of dirt is required. The import operation is expected to include 250 full loads per night, assuming 15 cubic yards per load, for a total of 3,750 cubic yards per night. To import 440,000 cubic yards, approximately 118 nights of import would be required.

The Project proposes to import dirt during the hours (8:00 p.m. to 4:00 a.m.) and complete grading operations both during daytime and nighttime hours. A source of import has been identified from the FST Sand and Gravel Mine, located east of the I-15 Freeway as shown on Exhibit 7-A. The dirt would be hauled from the borrow site on Minnesota Road to Sherborn Street to Magnolia Avenue to the I-15 Freeway southbound on ramp at Magnolia Avenue, exit at Cajalco Road and enter the Modified Project Site by crossing Cajalco Road from the southbound off-ramp with traffic control. Trucks would return onto Cajalco Road, enter I-15 Freeway northbound to Magnolia Avenue to Sherborn Street and travel south to the borrow site.

The proposed soil import/export haul route was specially developed to avoid potentially significant impacts to potential noise sensitive residential land uses. A review of the haul route shows that the only adjacent noise sensitive residential land uses are located adjacent to the I-15 Freeway. Many of these noise sensitive residential land uses benefit from existing sound walls that have been developed to control traffic noise from the I-15 Freeway.

The following analysis describes the potential off-site Project haul trips traffic noise impacts if all truck haul trips occur during the evening and nighttime hours from 8:00 pm to 4:00 am. This analysis describes the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The predicted future exterior noise levels (included in Appendix 7.2) represent the distance from the center of the roadway to the nearest noise receiver locations. Table 7-10 presents the Existing without Project off-site traffic CNEL noise levels which are expected to range from 58.4 to 71.1 dBA CNEL. Table 7-10 shows that the With Project Haul Truck Trips off-site traffic noise conditions will range from 63.8 to 72.8 dBA CNEL.

As shown on Table 7-10, the Project haul truck trips will generate a noise level increase ranging from 0.2 dBA CNEL on the I-15 Freeway to 5.4 dBA CNEL on Sherborn Street. Based on the significance criteria outlined above, the Project soil import/export truck trip-related noise level increases are considered *less than significant* impacts at the land uses adjacent to roadways conveying Project haul truck traffic.

EXHIBIT 7-A: SOIL IMPORT/EXPORT HAUL TRUCK ROUTE

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

ID	Road	Location	Adjacent Land Use	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Off-Site Traffic Noise Threshold[2]	Threshold Exceeded?
				No Haul	With Haul	Haul Addition			
1	I-15 Freeway	20225 Bedford Canyon Rd.	Residential	69.8	70.0	0.2	Yes	1.5	No
2	Magnolia Ave.	1295 Magnolia Ave.	Commercial	71.1	72.8	1.7	No	n/a	No
3	Sherborn St.	1168 Sherborn St.	Commercial/Industrial	58.4	63.8	5.4	No	n/a	No

[1] The CNEL is calculated at the nearest representative receiver of the nearest adjacent land use.

[2] Significance Criteria (Section 4). "n/a" not applicable, adjacent land use is not a noise sensitive.

8 ON-SITE NOISE IMPACTS

An on-site exterior noise impact analysis has been completed to determine the noise exposure levels that would result from adjacent traffic noise sources 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 the I-15 Freeway. The Project will also experience some background traffic noise impacts from its internal streets and parking lots, however, due to the low traffic volume and low speeds of vehicles travelling on these roadways, traffic noise will not make a significant contribution to the noise environment beyond of the right-of-way of each road.

8.1 EXTERIOR NOISE ANALYSIS

Using the FHWA traffic noise prediction model and the parameters outlined in Section 6, the expected future exterior noise levels for the noise sensitive on-site building were calculated. For noise-sensitive uses, Table 5 *Interior and Exterior Noise Standards* of the Public Health and Safety Element indicates that the exterior noise levels shall not exceed 65 dBA CNEL for the planned hotel use.

8.1.1 OUTDOOR COMMON AREAS

The 65 dBA CNEL exterior noise standards typically apply to outdoor areas where people congregate. In relation to the proposed Bedford Marketplace, the 65 dBA CNEL exterior noise standards apply only to the hotel outdoor pool area. The City of Corona does not identify any exterior noise standards for any of the commercial land use activities such as the outdoor patio areas for proposed restaurant uses.

Table 8-1 presents a summary of future exterior noise level impacts at the outdoor pool area of the hotel use. To minimize the potential exterior noise level impacts, the outdoor pool area is located behind the 4-story hotel building that effectively blocks the noise sensitive area from the I-15 Freeway. The on-site traffic noise level impacts indicate that outdoor pool area will experience unmitigated exterior noise levels of 52.3 dBA CNEL. Since the unmitigated on-site traffic noise levels satisfy the City of Corona 65 dBA CNEL exterior noise level standards, the on-site exterior traffic noise levels are considered *less than significant* impacts.

TABLE 8-1: UNMITIGATED EXTERIOR TRAFFIC NOISE LEVELS

Outdoor Common Area	Floor	Roadway	Exterior Noise Level (dBA CNEL)[1]	Threshold (dBA CNEL)[2]	Threshold Exceeded?
Hotel Pool	1	I-15 Freeway	52.3	65	No

[1] Unmitigated exterior noise level within the hotel outdoor pool area.

[2] Source: Public Health & Safety Element Interior and Exterior Noise Standards (Exhibit 3-B).

8.1.2 BUILDING FACADE

Table 8-2 presents a summary of future exterior noise levels at the 1st, 2nd, 3rd and 4th-floor hotel building facades. Exterior noise levels at the building façade are presented to estimate the interior noise levels. The on-site transportation analysis indicates that the unmitigated exterior noise levels will range from 66.3 to 71.5 dBA CNEL at the hotel building façades. The on-site traffic noise analysis calculations at are provided in Appendix 8.1.

TABLE 8-2: EXTERIOR TRAFFIC NOISE LEVELS AT THE BUILDING FACADE

Receiver Location	Roadway	Exterior Noise Level at Façade (dBA CNEL)			
		1st Floor	2nd Floor	3rd Floor	4th Floor
Hotel	I-15 Fwy.	66.3	71.5	71.4	71.4

8.2 INTERIOR NOISE ANALYSIS

To ensure that the interior noise levels comply with the City of Corona interior noise level standards, future noise levels were calculated at the estimated building façade locations. For noise-sensitive uses, Table 5 *Interior and Exterior Noise Standards* of the Public Health and Safety Element indicates that Interior noise levels shall not exceed 45 dBA CNEL for hotel uses and 55 dBA CNEL for all other commercial uses consistent with the General Plan Public Health and Safety Element interior and exterior noise standards (See Exhibit 3-B).

8.2.1 NOISE REDUCTION METHODOLOGY

The interior noise level is the difference between the predicted exterior noise level at the building facade and the noise reduction of the structure. Typical building construction will provide a Noise Reduction (NR) of approximately 25 dBA noise reduction with "windows closed." (19; 20) However, sound leaks, cracks and openings within the window assembly can greatly diminish its effectiveness in reducing noise. Several methods are used to improve interior noise reduction, including: (1) weather-stripped solid core exterior doors; (2) upgraded dual glazed windows; (3) mechanical ventilation/air conditioning; and (4) exterior wall/roof assembles free of cut outs or openings.

8.2.2 INTERIOR NOISE LEVEL ASSESSMENT

Table 8-2 shows that the Project buildings will require a windows-closed condition and a means of mechanical ventilation (e.g. air conditioning). Table 8-2 shows that the future exterior noise levels at the hotel building façades are expected to range from 66.3 to 71.5 dBA CNEL. The interior noise level analysis shows that the City of Corona 55 dBA CNEL interior noise standards can be satisfied using typical building construction for all commercial buildings. The interior noise analysis for the noise sensitive hotel use shows that the City of Corona 45 dBA CNEL interior noise standards can be satisfied using typical building construction with a minimum STC ratings of 30

for windows facing the I-15 Freeway. With the STC ratings of 30 for windows facing the I-15 Freeway, the future on-site interior traffic noise impacts will be *less than significant*.

TABLE 8-3: INTERIOR NOISE LEVELS (CNEL)

Receiver Location	Floor	Noise Level at Façade[1]	Required Interior NR[2]	Minimum Interior NR[3]	Upgraded Windows[4]	Interior Noise Level[5]	Threshold	Threshold Exceeded?
Hotel	1	66.3	21.3	30.0	Yes	36.3	45	No
	2	71.5	26.5	30.0	Yes	41.5	45	No
	3	71.4	26.4	30.0	Yes	41.4	45	No
	4	71.4	26.4	30.0	Yes	41.4	45	No

[1] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).
[2] Noise reduction required to satisfy the City of Corona 45 dBA CNEL interior noise standard for noise sensitive uses.
[3] Estimated interior noise reduction with upgraded windows with an STC rating of 30.
[4] Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of 30?
[5] Estimated interior noise level with STC rating of for all windows facing the I-15 Freeway.
"NR" = Noise Reduction

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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. Consistent with CEQA Guidelines Section 15125, the noise sensitive locations described below represent only those locations *as they exist at the time the notice of preparation (NOP) is published.* The Bedford Marketplace NOP was published on October 28, 2019 prior to the development and occupancy of the future residential community (Tentative Tract Map No. 37644) located west of Bedford Canyon Road. Therefore, no receivers have been identified for the planned Tentative Tract Map No. 37644 since the Bedford Marketplace will likely be developed prior to occupancy of the nearby residential community. However, noise sensitive receivers have been identified for existing Bedford South Corona community (Tentative Tract Map No. 37030).

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 and a church, 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.

R1: Located approximately 285 feet northwest of the Project site, R1 represents existing residential homes north of Eagle Glen Parkway. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing residential homes located west of the Project site at roughly 1,343 feet, on the west side of Glen Eagle Parkway. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R3: Location R3 represents the existing residential homes on the east side of North Weirick Road at approximately 1,276 feet from the Project site. A 24-hour noise measurement near this location, L3, is used to describe the existing ambient noise environment.

R4: Location R4 represents the existing residential homes on the south side of Glen Road at approximately 1,137 feet from 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 Hudson House outdoor community center recreation area for the Bedford South Corona community located approximately 1,502 feet from the Project site. A 24-hour noise measurement near this location, L2, is used to describe the existing ambient noise environment.

EXHIBIT 9-A: SENSITIVE RECEIVER LOCATIONS

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10 OPERATIONAL IMPACTS

This section analyzes the potential operational noise impacts due to the Project's stationary noise sources on the off-site sensitive receiver locations identified in Section 9. Exhibit 10-A identifies the noise source locations used to assess the Project-related operational noise levels.

10.1 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.

It is important to note that the following projected noise levels assume the worst-case noise environment with the roof-top air conditioning units, drive-thru speakerphones, trash enclosures, parking lots, gas station activity, car wash tunnel, car wash vacuums, and outdoor playground activity all operating simultaneously. These noise level impacts will vary throughout the day. All noise sources were modeled assuming peak operational activity with no periods of inactivity, and are assumed to operate simultaneously, to present a conservative analysis.

TABLE 10-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Measurement Duration (hh:mm:ss)	Distance From Source (Feet)	Noise Source Height (Feet)	Reference Noise Levels (dBA L_{50})	
				@ Ref. Dist.	@ 50 Feet
Roof-Top Air Conditioning Units[1]	96:00:00	5'	5'	74.4	54.4
Drive-Through Speakerphone[2]	00:03:00	15'	3'	60.9	50.4
Trash Enclosure Activity[3]	00:00:32	5'	5'	69.0	49.0
Commercial Parking Lot[4]	00:15:00	5'	5'	56.7	36.7
Gas Station Activities[5]	01:00:00	5'	5'	65.6	45.6
Car Wash Tunnel[6]	00:03:04	10'	8'	81.6	67.6
Car Wash Vacuum[7]	00:01:02	5'	3'	74.2	54.2
Outdoor Playground[8]	00:15:00	5'	5'	61.7	41.7

[1] As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.
[2] As measured by Urban Crossroads, Inc. on 12/19/2014 at a Panera Bread drive-thru in the City of Brea.
[3] As measured by Urban Crossroads, Inc. on 5/3/2018 at trash enclosure in a parking lot in the City of Costa Mesa.
[4] As measured by Urban Crossroads, Inc. on 5/30/2012 at the Laguna Niguel Walmart located at 27470 Alicia Parkway.
[5] As measured by Urban Crossroads, Inc. on 4/26/2016 at an ARCO gas station located at 6501 Quail Hill Parkway in the City of Irvine.
[6] As measured by Urban Crossroads, Inc. on 6/6/2016 at the Audi Mission Viejo Dealership located at 28451 Marguerite Parkway.
[7] As measured by Urban Crossroads, Inc. on 5/27/2011 at an express car wash located at 1195 Baker Street in Costa Mesa.
8 As measured by Urban Crossroads, Inc. on 10/8/2014 at an outdoor playground in Ladera Ranch.

EXHIBIT 10-A: OPERATIONAL NOISE SOURCE LOCATIONS

10.1.1 ROOF-TOP AIR CONDITIONING UNITS

To assess the noise levels created by the roof-top air conditioning units at the Project site, reference noise levels measurements were taken at the Santee Walmart on July 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe a single mechanical roof-top air conditioning unit on the roof of an existing Walmart store with additional background units. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit in addition to background units operating simultaneously. Using a uniform reference distance of 50 feet, the reference noise level noise level is 54.4 dBA L_{50}. 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 noise attenuation provided by a parapet wall is not reflected in this reference noise level measurement.

10.1.2 DRIVE-THROUGH SPEAKERPHONE

To describe the potential noise level impacts associated with potential drive-through speakerphones and vehicle activities, a reference noise level measurement was collected on Friday, December 19th, 2014 at a Panera Bread restaurant located at 423 South Associated Road in the City of Brea. The reference noise levels collected at the Panera Bread restaurant are expected to reflect potential drive-through speakerphone noise level activities at the Project site, since the reference measurement includes both drive-through speakerphone and vehicle activity noise. The noise sources included in the reference noise level measurement consist of voices of the Panera Bread employees over the speakerphone, customers' voices ordering food, car engines idling, car radios playing music, and cars queuing in the drive-through lane. At 50 feet from the speakerphone, a reference noise level of 50.4 dBA L_{50} was measured. This reference noise level measurement overstates the actual average noise levels since it represents the average of 28 speakerphone menu board ordering events observed over a two-hour period. In other words, the Panera Bread speakerphone menu board reference noise level describes continuous drive-through operations and does not include any periods of inactivity.

10.1.3 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure, Urban Crossroads collected a reference noise level measurement on May 3rd, 2018 at an existing commercial and office park trash enclosure within a parking lot on the northeast corner of Baker Street and Red Hill Avenue. The measured reference noise level at the uniform 50-foot reference distance is 49.0 dBA L_{50} for the trash enclosure activity. The trash enclosure activity noise levels include two metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, trash dropping into the metal dumpster, and background parking lot vehicle movements.

10.1.4 COMMERCIAL PARKING LOT

To determine the noise levels associated with commercial parking lot vehicle movements, Urban Crossroads collected reference noise level measurements at the Laguna Niguel Walmart located at 27470 Alicia Parkway on May 30, 2012. The 15-minute noise level measurement indicates that the parking lot vehicle movements generates noise levels of 36.7 dBA L_{50} at a normalized distance of 50 feet. The parking lot noise levels are mainly due to cars pulling in and out of spaces, car alarms sounding, and customers moving shopping carts.

10.1.5 GAS STATION ACTIVITIES

To describe the potential noise level impacts created by the gas station of the Project, a reference noise level measurement was collected on Tuesday, April 26th, 2016 at an ARCO gas station located at 6501 Quail Hill Parkway in the City of Irvine. The reference noise level measurement includes six cars fueling at once, car doors closing, engines starting, fuel pump TV sounds and background car pass-by events within a 3-minute period. At 50 feet from the gas station, a reference noise level of 45.6 dBA L_{50} was measured.

10.1.6 CAR WASH TUNNEL AIR BLOWERS

On June 10th, 2016, a reference noise level measurement was taken by Urban Crossroads at the Audi Mission Viejo dealership to describe the air blowers used in a car wash tunnel. A reference noise level of 67.6 dBA L_{50} was measured at the uniform distance of 50 feet. The reference noise level measurement includes an exposed five-unit air blower system with background pressure washer noise and is used to represent the proposed Project facilities. It is anticipated that the air dryers within the proposed car wash will operate continuously during the peak operating conditions. Further, this noise analysis does not include any additional attenuation or directional influence provided by locating the car wash air blower and dryer equipment inside the tunnel itself, but rather, models the tunnel exit activities as occurring at the building façade. As such, the analysis may conservatively overstate actual noise levels produced by the car wash tunnel air blower and dryer equipment.

10.1.7 CAR WASH VACUUM ACTIVITY

To represent the self-serve vacuums within the Project site, a reference noise level measurement was collected on May 27th, 2011 at an express car wash located at 1195 Baker Street in the City of Costa Mesa. The reference noise level measurement represents up to four vacuums operating simultaneously at the Costa Mesa express car wash. At a uniform reference distance of 50 feet, the vacuum reference noise level is 54.2 dBA L_{50}. This reference car wash vacuum activity noise level is anticipated to conservatively overstate those of the Project, since this reference noise level includes more vacuums operating simultaneously (4 vacuums) than what will be possible at the Project site (2 vacuums).

10.1.8 OUTDOOR PLAYGROUND ACTIVITIES

To describe the potential noise level impacts associated with the Project's playground activities ("tot-lot" and turf play areas), a reference noise level measurement was collected on Wednesday, October 8th, 2014 at the Founders Park in the City of Ladera Ranch. The reference noise levels collected at the Founders Park are expected to reflect the noise level activities at the tot-lot and turf play areas within Project site, since the reference noise level measurement includes tot-lot activities, girls youth soccer, coaches shouting instructions, parents speaking on cell phones, kids playing on swing sets, cheering and clapping. At a uniform reference distance of 50 feet, the outdoor playground activity reference noise level is 41.7 dBA L_{50}.

10.2 PROJECT OPERATIONAL NOISE LEVELS

Based upon the reference noise levels, it is possible to estimate the Project operational stationary-source noise levels at each of the sensitive receiver locations. The operational noise level calculations shown on Table 10-2 account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. 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. The basic noise attenuation equation shown below is used to calculate the distance attenuation based on a reference noise level (SPL_1):

$$SPL_2 = SPL_1 - 20\log(D_2/D_1)$$

Where SPL_2 is the resulting noise level after attenuation, SPL_1 is the source noise level, D_2 is the distance to the reference sound pressure level (SPL_1), and D_1 is the distance to the receiver location.

Table 10-2 indicates that the unmitigated combined Project operational noise levels associated with the roof-top air conditioning units, drive-thru speakerphones, trash enclosures, parking lots, gas station activity, car wash tunnel, car wash vacuums, and outdoor playground activity are expected to range from 32.7 to 40.0 dBA L_{50} at the noise-sensitive off-site receiver locations. The unmitigated operational noise level calculation worksheets are included in Appendix 10.1.

TABLE 10-2: UNMITIGATED PROJECT OPERATIONAL NOISE LEVELS

Receiver Location[1]	Noise Sources[2]	Distance (Feet)	Operational Noise Levels (dBA)[3]				
			L_{50} (30 mins)	L_{25} (15 mins)	L_8 (5 mins)	L_2 (1 min)	L_{max} (Anytime)
R1	Air Conditioning Unit (Roof-Top)	445'	28.5	30.2	31.5	31.8	32.3
	Drive-Through Speakerphone	741'	20.3	21.5	23.0	24.7	25.8
	Trash Enclosure	517'	16.6	22.6	29.6	34.6	36.1
	Parking Lot	574'	8.5	12.5	15.5	18.9	31.3
	Gas Station Activity	591'	17.1	18.4	21.0	25.9	33.9
	Car Wash Tunnel	575'	39.4	49.8	50.4	51.1	51.6
	Car Wash Vacuum Activity	608'	25.6	26.8	28.6	29.4	30.2
	Outdoor Playground	741'	11.5	13.9	16.8	19.5	23.7
	Combined Noise Level:		40.0	49.9	50.5	51.3	51.9
R2	Air Conditioning Unit (Roof-Top)	1,815'	23.2	24.9	26.2	26.5	27.0
	Drive-Through Speakerphone	2,777'	15.6	16.8	18.3	20.0	21.1
	Trash Enclosure	1,910'	12.6	18.6	25.6	30.6	32.1
	Parking Lot	1,775'	5.7	9.7	12.7	16.1	28.5
	Gas Station Activity	2,940'	10.2	11.5	14.1	19.0	27.0
	Car Wash Tunnel	3,108'	31.8	42.2	42.8	43.5	44.0
	Car Wash Vacuum Activity	2,878'	19.0	20.2	22.0	22.8	23.6
	Outdoor Playground	1,877'	10.2	12.6	15.5	18.2	22.4
	Combined Noise Level:		32.7	42.3	43.0	43.9	44.6
R3	Air Conditioning Unit (Roof-Top)	1,896'	22.8	24.5	25.8	26.1	26.6
	Drive-Through Speakerphone	2,604'	16.1	17.3	18.8	20.5	21.6
	Trash Enclosure	1,847'	12.9	18.9	25.9	30.9	32.4
	Parking Lot	1,834'	5.4	9.4	12.4	15.8	28.2
	Gas Station Activity	2,772'	10.7	12.0	14.6	19.5	27.5
	Car Wash Tunnel	2,876'	32.4	42.8	43.4	44.1	44.6
	Car Wash Vacuum Activity	2,752'	19.4	20.6	22.4	23.2	24.0
	Outdoor Playground	1,743'	10.9	13.3	16.2	18.9	23.1
	Combined Noise Level:		33.2	42.9	43.6	44.5	45.2

Receiver Location[1]	Noise Sources[2]	Distance (Feet)	Operational Noise Levels (dBA)[3]				
			L_{50} (30 mins)	L_{25} (15 mins)	L_8 (5 mins)	L_2 (1 min)	L_{max} (Anytime)
R4	Air Conditioning Unit (Roof-Top)	1,230'	20.3	22.0	23.3	23.6	24.1
	Drive-Through Speakerphone	1,244'	16.0	17.2	18.7	20.4	21.5
	Trash Enclosure	1,251'	9.7	15.7	22.7	27.7	29.2
	Parking Lot	1,148'	2.8	6.8	9.8	13.2	25.6
	Gas Station Activity	1,208'	11.4	12.7	15.3	20.2	28.2
	Car Wash Tunnel	1,303'	32.9	43.3	43.9	44.6	45.1
	Car Wash Vacuum Activity	1,358'	19.2	20.4	22.2	23.0	23.8
	Outdoor Playground	1,744'	4.6	7.0	9.9	12.6	16.8
	Combined Noise Level:		33.4	43.4	44.0	44.8	45.4
R5	Air Conditioning Unit (Roof-Top)	1,637'	24.1	25.8	27.1	27.4	27.9
	Drive-Through Speakerphone	1,961'	18.6	19.8	21.3	23.0	24.1
	Trash Enclosure	1,635'	13.9	19.9	26.9	31.9	33.4
	Parking Lot	1,647'	6.3	10.3	13.3	16.7	29.1
	Gas Station Activity	2,096'	13.2	14.5	17.1	22.0	30.0
	Car Wash Tunnel	2,239'	34.6	45.0	45.6	46.3	46.8
	Car Wash Vacuum Activity	2,181'	21.4	22.6	24.4	25.2	26.0
	Outdoor Playground	1,561'	11.8	14.2	17.1	19.8	24.0
	Combined Noise Level:		35.3	45.1	45.8	46.6	47.3

[1] See Exhibit 10-A for the noise source locations.
[2] Reference noise sources as shown on Table 10-1.
[3] Stationary source noise level calculations are provided in Appendix 10.1.

10.3 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

Table 10-3 indicates that the noise levels associated with Project operational noise sources are expected to range from 32.7 to 40.0 dBA L_{50} at sensitive off-site sensitive receiver locations. Table 10-3 shows that the Project operational-source noise levels at potentially affected receivers satisfy the City of Corona daytime and nighttime exterior noise level standards without mitigation. Therefore, the unmitigated Project operational noise level impacts are considered *less than significant.*

TABLE 10-3: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Land Use	Noise Level at Receiver Locations (dBA)[2]					Threshold Exceeded?[3]	
		L_{50} (30 mins)	L_{25} (15 mins)	L_8 (5 mins)	L_2 (1 min)	L_{max} (Anytime)	Daytime	Nighttime
Exterior Noise Level Standards	**Daytime Residential**	**55**	**60**	**65**	**70**	**75**	**-**	**-**
	Nighttime Residential	**50**	**55**	**60**	**65**	**70**	**-**	**-**
R1	Residential	40.0	49.9	50.5	51.3	51.9	No	No
R2	Residential	32.7	42.3	43.0	43.9	44.6	No	No
R3	Residential	33.2	42.9	43.6	44.5	45.2	No	No
R4	Residential	33.4	43.4	44.0	44.8	45.4	No	No
R5	Residential	35.3	45.1	45.8	46.6	47.3	No	No

[1] See Exhibit 10-A for the noise source locations.
[2] Estimated Project operational noise levels as shown on Table 10-2.
[3] Do the Project operational noise levels satisfy the operational noise level standards?
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

10.4 PROJECT OPERATIONAL NOISE LEVEL CONTRIBUTIONS

To describe the Project operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (3) Instead, they must be logarithmically added using the following base equation:

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

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level contributions to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the daytime and nighttime ambient conditions are presented on Tables 10-4 and 10-5, respectively.

As indicated on Tables 10-4 and 10-5, the Project will generate daytime and nighttime operational noise level increases of up to 0.2 dBA L_{50} at the nearby receiver locations. Since the Project-related operational noise level contributions with mitigation will satisfy the operational noise level increase significance criteria presented in Table 4-2, the increases at the sensitive receiver locations will be *less than significant*.

TABLE 10-4: PROJECT DAYTIME OPERATIONAL NOISE CONTRIBUTIONS

Receiver Location[1]	Unmitigated Project Operational Noise Level (dBA)[2]	Meas. Location[3]	Reference Ambient Noise Levels (dBA)[4]	Combined Project and Ambient (dBA)[5]	Project Increase (dBA)[6]	Threshold (dBA)[7]	Threshold Exceeded?[7]
R1	40.0	L1	60.2	60.2	0.0	3.0	No
R2	32.7	L1	60.2	60.2	0.0	3.0	No
R3	33.2	L3	52.0	52.1	0.1	5.0	No
R4	33.4	L4	47.7	47.9	0.2	5.0	No
R5	35.3	L2	54.4	54.5	0.1	5.0	No

[1] See Exhibit 9-A for the sensitive receiver locations.
[2] Total Project 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] FICON significance criteria as defined in Section 4, Table 4-1, based on the ambient noise level without the Project.

TABLE 10-5: PROJECT NIGHTTIME OPERATIONAL NOISE CONTRIBUTIONS

Receiver Location[1]	Unmitigated Project Operational Noise Level (dBA)[2]	Meas. Location[3]	Reference Ambient Noise Levels (dBA)[4]	Combined Project and Ambient (dBA)[5]	Project Increase (dBA)[6]	Threshold (dBA)[7]	Threshold Exceeded?[7]
R1	40.0	L1	53.7	53.9	0.2	5.0	No
R2	32.7	L1	53.7	53.7	0.0	5.0	No
R3	33.2	L3	50.8	50.9	0.1	5.0	No
R4	33.4	L4	47.7	47.9	0.2	5.0	No
R5	35.3	L2	52.1	52.2	0.1	5.0	No

[1] See Exhibit 9-A for the sensitive receiver locations.
[2] Total Project 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] FICON significance criteria as defined in Section 4, Table 4-1, based on the ambient noise level without the Project.

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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 boundaries of the soil import/export activity area and the construction activity areas at the Project site in relation to the nearby sensitive receiver locations.

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:

- Soil Import/Export
- 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 in excess of 80 dBA when measured at 50 feet. Hard site conditions are used in the construction 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 (i.e. construction equipment). For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages used in this analysis are consistent with the data used to support the construction emissions in the *Bedford Marketplace Air Quality Impact Analysis* prepared by Urban Crossroads, Inc. (21)

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, all construction noise level measurements presented on Table 11-1 have been adjusted to describe a common reference distance of 50 feet.

EXHIBIT 11-A: CONSTRUCTION NOISE SOURCE LOCATIONS

LEGEND:

- Receiver Locations
- 6' Existing Barrier Height (in feet)
- Existing Barrier
- Phase 2B Borrow
- FST Sand and Gravel Mine Borrow'
- Construction Area
- Distance from receiver to construction activity (in feet)

TABLE 11-1: CONSTRUCTION REFERENCE NOISE LEVELS

ID	Noise Source	Duration (h:mm:ss)	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA L_{max})	Reference Noise Levels @ 50 Feet (dBA L_{max})[6]
1	Truck Pass-Bys & Dozer Activity[1]	0:01:15	30'	68.1	63.7
2	Dozer Activity[1]	0:01:00	30'	76.4	72.0
3	Construction Vehicle Maintenance Activities[2]	0:01:00	30'	74.8	70.4
4	Foundation Trenching[2]	0:01:01	30'	74.9	70.5
5	Rough Grading Activities[2]	0:05:00	30'	84.8	80.4
6	Framing[3]	0:02:00	30'	76.7	72.3
7	Scraper, Water Truck, & Dozer Activity[4]	0:30:00	30'	87.7	83.3
8	Concrete Mixer Truck Movements[5]	0:01:00	50'	73.1	73.1
9	Concrete Paver Activities[5]	0:01:00	30'	75.7	71.3
10	Concrete Mixer Pour & Paving Activities[5]	0:01:00	30'	76.3	71.9
11	Concrete Mixer Backup Alarms & Air Brakes[5]	0:00:20	50'	78.8	78.8
12	Concrete Mixer Pour Activities[5]	1:00:00	50'	79.2	79.2

[1] As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.
[2] As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.
[3] As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.
[4] As measured by Urban Crossroads, Inc. on 10/30/15 during grading operations at an industrial construction site in the City of Ontario.
[5] Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.
[6] Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

11.3 SOIL IMPORT/EXPORT CONSTRUCTION BORROW SITES

To bring the Modified Bedford Marketplace Project Site up to an elevation similar (within five feet) of the existing 10-acre commercial pad, import of approximately 440,000 cubic yards of dirt is required. The applicant has identified two potential borrow sites to provide the necessary fill dirt. The FST Sand and Gravel Mine, located east of the I-15 Freeway and the Arantine Hills Specific Plan Phase 2B site as shown on Exhibit 11-A.

11.3.1 FST SAND AND GRAVEL MINE BORROW SITE

The import operation is expected to include 250 full loads per night, assuming 15 cubic yards per load, for a total of 3,750 cubic yards per night. To import 440,000 cubic yards, approximately 118 nights of import would be required. The Project proposes to import dirt during the hours (8:00 p.m. to 4:00 a.m.) and complete grading operations both during daytime and nighttime hours.

During the nighttime hours, dirt would be imported to the Modified Project Site, dumped, and placed by grading equipment. Daytime grading activities would initially last for approximately two weeks and begin before import and overlap with initial import operations. The daytime activities include remedial grading, which requires the over-excavation of approximately four to six feet below existing ground surface. The over-excavated material would be stockpiled on site.

Additional daytime grading would occur after imported material has be placed in the over-excavated areas to bring the site closer to proposed grades. The stockpiled material would then be placed over the imported material to create the finished building pad, compacted to meet geotechnical specifications. According to the Project applicant, every effort will be made to limit on-site construction activities particularly during the noise sensitive nighttime hours. For this reason, the Applicant is proposing to limit nighttime operations to permit only the essential equipment needed to support the soil import/export haul truck operations. This focused on-site construction noise analysis is based on the following construction equipment profile:

Daytime: During the daytime hours from 7:00 a.m. to 7:00 p.m. the project will rely on the following equipment for the over-excavation activities:

- three (3) Caterpillar 651 scrapers
- one (1) tracked bulldozer (Caterpillar D-8)
- one (1) water truck

Nighttime: According the Project applicant nighttime (8:00 p.m. to 4:00 a.m.) construction activities will be limited to the following construction equipment:

- one (1) rubber tire bulldozer, such as a Caterpillar 834, would be used to move and compact the imported dirt. The site is large enough to avoid backing up and the use of warning signals. Additionally, the rubber tire equipment would be used to avoid the noise from tracked equipment.
- one (1) water truck (4,000 gallon)
- one (1) street sweeper would be used during the import operation.

11.3.2 PHASE 2B BORROW SITE

As a potential borrow site, Phase 2B could provide the necessary source of dirt to support the planned Bedford Marketplace pad elevation increase. Preliminary estimates suggest that the existing Phase 2B site will be lowered by approximately 13 feet to provide the necessary supply of dirt for import. Due to the proximity to the Bedford Marketplace, import of dirt from Phase 2B will limited to the daytime hours from 7:00 a.m. to 7:00 p.m.

11.4 SOIL IMPORT/EXPORT CONSTRUCTION NOISE ANALYSIS

To describe the soil import/export construction noise impacts at nearby noise sensitive receiver locations, exterior noise levels have been calculated for the daytime and the potential nighttime activities.

11.4.1 SOIL IMPORT/EXPORT CONSTRUCTION NOISE ANALYSIS (DAYTIME)

Based on the daytime construction equipment profile, Table 11-2 provides a summary of the estimated daytime construction noise levels for each borrow site at each of the sensitive receiver locations nearest the soil import/export area identified on Exhibit 11-A. Table 11-2 shows that the daytime import/export construction noise levels will range from 51.2 to 59.1 dBA L_{max} for the FST Sand and Gravel Mine borrow site. Since Phase 2B borrow site is closer to the nearby receiver

locations, the daytime import/export construction noise levels will range from 49.0 to 68.0 dBA L_{max}

TABLE 11-2: SOIL IMPORT/EXPORT ACTIVITY NOISE LEVELS (DAYTIME)

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Truck Pass-Bys & Dozer Activity	63.7
Dozer Activity	72.0
Rough Grading Activities	80.4
Scraper, Water Truck, & Dozer Activity	83.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	83.3

Borrow Site	Receiver Location	Distance to Closest Fill Site Activity (Feet)[2]	Distance Attenuation (dBA L_{max})[3]	Estimated Noise Barrier Attenuation (dBA L_{max})[4]	Construction Noise Level (dBA L_{max})
FST Sand and Gravel Mine	R1	808'	-24.2	0.0	59.1
	R2	1,435'	-29.2	0.0	54.1
	R3	1,830'	-31.3	0.0	52.0
	R4	1,549'	-29.8	0.0	53.4
	R5	2,016'	-32.1	0.0	51.2
Phase 2B	R1	2,569'	-34.2	0.0	49.0
	R2	289'	-15.2	0.0	68.0
	R3	524'	-20.4	0.0	62.9
	R4	2,502'	-34.0	0.0	49.3
	R5	1,207'	-27.7	0.0	55.6

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers in the Project study area, if any.

11.4.2 SOIL IMPORT/EXPORT CONSTRUCTION NOISE ANALYSIS (NIGHTTIME)

Based on the nighttime construction equipment profile for the FST Sand and Gravel Mine construction activity, Table 11-3 provides a summary of the estimated nighttime construction noise levels at each of the sensitive receiver locations. No nighttime construction is needed to support the Phase 2B borrow site. As shown on Table 11-3 the Project-related daytime soil import/export construction noise levels when the highest reference noise level is operating will range from 39.9 to 47.8 dBA L_{max}.

TABLE 11-3: SOIL IMPORT/EXPORT ACTIVITY NOISE LEVELS (NIGHTTIME)

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Truck Pass-Bys & Dozer Activity	63.7
Dozer Activity	72.0
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	72.0

Borrow Site	Receiver Location	Distance to Closest Fill Site Activity (Feet)[2]	Distance Attenuation (dBA L_{max})[3]	Estimated Noise Barrier Attenuation (dBA L_{max})[4]	Construction Noise Level (dBA L_{max})
FST Sand and Gravel Mine	R1	808'	-24.2	0.0	47.8
	R2	1,435'	-29.2	0.0	42.8
	R3	1,830'	-31.3	0.0	40.7
	R4	1,549'	-29.8	0.0	42.1
	R5	2,016'	-32.1	0.0	39.9

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers in the Project study area, if any.

11.5 SOIL IMPORT/EXPORT NOISE COMPLIANCE

To analyze noise impacts originating from the construction of the Bedford Marketplace, noise from construction activities are typically evaluated against standards established under a City's Municipal Code. The City of Corona Municipal Code, Section 17.84.040(D)(2) establishes the permitted hours during which construction within the City of Corona may take place, between 7:00 a.m. to 8:00 p.m. on Mondays through Saturdays, and 10:00 a.m. to 6:00 p.m. on Sundays and holidays. (11) Therefore, the planned nighttime Project soil import/export activity will require a noise variance consistent with the provisions outlined in the City of Corona Municipal Code Section 17.84.040(H)(1) to perform the evening and nighttime grading activities.

For daytime construction activities, this analysis relies on the City of Corona Municipal Code Section 17.84.040 permitted daytime operational noise standards for residential properties to establish the exterior construction noise level criteria. Based on these criteria, a daytime exterior noise level of 75 dBA L_{max} is be used to describe the maximum acceptable threshold for determining the impacts due to Project construction for sensitive receivers. To account for the noise sensitive nighttime hours between 10:00 p.m. and 7:00 a.m., this analysis relies on a maximum exterior noise level of 50 dBA L_{max}.

11.5.1 SOIL IMPORT/EXPORT NOISE COMPLIANCE (DAYTIME)

As shown on Table 11-4 the estimated Project daytime construction noise levels will approach 59.1 dBA L_{max} for construction activity associated with the FST Sand and Gravel Mine and 68.0 dBA L_{max} for Phase 2B construction activity. The analysis shows that either borrow site will satisfy the City of Corona maximum acceptable threshold for determining the impacts due to Project construction for sensitive receiver's daytime exterior noise level of 75 dBA L_{max}. Therefore, based on the results of the analysis, all nearby receiver locations will experience *less than significant* impacts due to the daytime soil import/export noise construction noise levels at the Project site.

TABLE 11-4: SOIL IMPORT/EXPORT NOISE COMPLIANCE (DAYTIME)

Borrow Site	Receiver Location[1]	Unmitigated Construction Noise Levels (dBA L_{max})[2]	Daytime	
			Threshold (dBA L_{max})[3]	Threshold Exceeded?[4]
FST Sand and Gravel Mine	R1	59.1	75	No
	R2	54.1	75	No
	R3	52.0	75	No
	R4	53.4	75	No
	R5	51.2	75	No
Phase 2B	R1	49.0	75	No
	R2	68.0	75	No
	R3	62.9	75	No
	R4	49.3	75	No
	R5	55.6	75	No

[1] Noise receiver locations are shown on Exhibit 9-A
[2] Estimated daytime construction noise levels, as shown on Table 11-2
[3] City of Corona Daytime Construction noise standard.
[4] Do the estimated Project construction noise levels satisfy the construction noise level threshold?

11.5.2 SOIL IMPORT/EXPORT NOISE COMPLIANCE (NIGHTTIME)

As shown on Table 11-5 the estimated Project nighttime construction noise levels from the import of dirt from the FST Sand and Gravel Mine will satisfy the City of Corona 50 dBA L_{max} stationary source nighttime noise level thresholds at all receiver locations. Therefore, based on the results of the analysis, all nearby receiver locations will experience *less than significant* impacts due to the nighttime soil import/export noise construction noise levels at the Project site. However, planned nighttime Project soil import/export activity will require a noise variance consistent with the provisions outlined in the City of Corona Municipal Code Section 17.84.040(H)(1) to perform the evening and nighttime grading activities.

TABLE 11-5: SOIL IMPORT/EXPORT NOISE COMPLIANCE (NIGHTTIME)

Borrow Site	Receiver Location[1]	Unmitigated Construction Noise Levels (dBA L_{max})[2]	Nighttime	
			Threshold (dBA L_{max})[3]	Threshold Exceeded?[4]
FST Sand and Gravel Mine	R1	47.8	50	No
	R2	42.8	50	No
	R3	40.7	50	No
	R4	42.1	50	No
	R5	39.9	50	No

[1] Noise receiver locations are shown on Exhibit 9-A
[2] Estimated nighttime construction noise levels, as shown on Table 11-3
[3] City of Corona Nighttime Construction noise standard.
[4] Do the estimated Project construction noise levels satisfy the construction noise level threshold?

11.6 CONSTRUCTION NOISE ANALYSIS

Tables 11-6 to 11-9 show the Project construction stages and the reference construction noise levels used for each stage. Table 11-10 provides a summary of the noise levels from each stage of construction at each of the sensitive receiver locations. Based on the reference construction noise levels, the Project-related construction noise levels when the highest reference noise level is operating at the edge of primary construction activity nearest each sensitive receiver location will range from 50.9 to 63.9 dBA L_{max} at the noise-sensitive receiver locations, as shown on Table 11-10

TABLE 11-6: GRADING ACTIVITY NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Truck Pass-Bys & Dozer Activity	63.7
Dozer Activity	72.0
Rough Grading Activities	80.4
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	80.4

Receiver Location	Distance to Project Site Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{max})[3]	Estimated Noise Barrier Attenuation (dBA L_{max})[4]	Construction Noise Level (dBA L_{max})
R1	332'	-16.4	0.0	63.9
R2	1,383'	-28.8	0.0	51.5
R3	1,303'	-28.3	0.0	52.0
R4	1,361'	-28.7	0.0	51.7
R5	1,494'	-29.5	0.0	50.9

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers in the Project study area, if any.

TABLE 11-7: BUILDING CONSTRUCTION ACTIVITY NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Construction Vehicle Maintenance Activities	70.4
Foundation Trenching	70.5
Framing	72.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	72.3

Receiver Location	Distance to Project Site Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{max})[3]	Estimated Noise Barrier Attenuation (dBA L_{max})[4]	Construction Noise Level (dBA L_{max})
R1	332'	-16.4	0.0	55.8
R2	1,383'	-28.8	0.0	43.4
R3	1,303'	-28.3	0.0	43.9
R4	1,361'	-28.7	0.0	43.6
R5	1,494'	-29.5	0.0	42.8

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers in the Project study area, if any.

TABLE 11-8: PAVING ACTIVITY NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Concrete Mixer Truck Movements	73.1
Concrete Paver Activities	71.3
Concrete Mixer Pour & Paving Activities	71.9
Concrete Mixer Backup Alarms & Air Brakes	78.8
Concrete Mixer Pour Activities	79.2
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	79.2

Receiver Location	Distance to Project Site Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{max})[3]	Estimated Noise Barrier Attenuation (dBA L_{max})[4]	Construction Noise Level (dBA L_{max})
R1	332'	-16.4	0.0	62.8
R2	1,383'	-28.8	0.0	50.4
R3	1,303'	-28.3	0.0	50.9
R4	1,361'	-28.7	0.0	50.5
R5	1,494'	-29.5	0.0	49.7

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers in the Project study area, if any.

TABLE 11-9: ARCHITECTURAL COATING ACTIVITY NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Construction Vehicle Maintenance Activities	70.4
Framing	72.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	72.3

Receiver Location	Distance to Project Site Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{max})[3]	Estimated Noise Barrier Attenuation (dBA L_{max})[4]	Construction Noise Level (dBA L_{max})
R1	332'	-16.4	0.0	55.8
R2	1,383'	-28.8	0.0	43.4
R3	1,303'	-28.3	0.0	43.9
R4	1,361'	-28.7	0.0	43.6
R5	1,494'	-29.5	0.0	42.8

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers in the Project study area, if any.

TABLE 11-10: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels by Stage (dBA L_{max})				
	Grading	Building Construction	Paving	Architectural Coating	Highest Construction Noise Level[2]
R1	63.9	55.8	62.8	55.8	63.9
R2	51.5	43.4	50.4	43.4	51.5
R3	52.0	43.9	50.9	43.9	52.0
R4	51.7	43.6	50.5	43.6	51.7
R5	50.9	42.8	49.7	42.8	50.9

[1] Noise receiver locations are shown on Exhibit 9-A.
[2] Estimated construction noise levels based on the highest reference construction activity for each stage.

11.7 CONSTRUCTION NOISE LEVEL COMPLIANCE

The construction noise analysis shows that the highest construction noise levels will occur when construction activities take place at the closest point from primary Project construction activity to each of the nearby receiver locations. As shown on Table 11-11, the unmitigated construction noise levels are expected to range from 50.9 to 63.9 dBA L_{max} at the nearby receiver locations.

To evaluate whether the Project will generate potentially significant short-term noise levels at off-site sensitive receiver locations a construction-related noise level threshold of 75 dBA L_{max} is used as acceptable thresholds for construction noise at the nearby sensitive receiver locations. Table 11-11 shows the highest construction noise levels at the potentially impacted receiver locations are expected to approach 63.9 dBA L_{max} and will satisfy the 75 dBA L_{max} daytime significance threshold during temporary Project construction activities. The noise impact due to unmitigated Project construction noise levels is, therefore, considered a *less than significant* impact at all nearby sensitive receiver locations.

TABLE 11-11: CONSTRUCTION EQUIPMENT NOISE LEVEL COMPLIANCE

Receiver Location[1]	Unmitigated Construction Noise Levels (dBA L_{max})[2]	Daytime	
		Threshold (dBA L_{max})[3]	Threshold Exceeded?[4]
R1	63.9	75	No
R2	51.5	75	No
R3	52.0	75	No
R4	51.7	75	No
R5	50.9	75	No

[1] Noise receiver locations are shown on Exhibit 11-A
[2] Estimated daytime construction noise levels, as shown on Table 11-2
[3] City of Corona Daytime Construction noise standard.
[4] Do the estimated Project construction noise levels satisfy the construction noise level threshold?

11.8 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). Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include mobile equipment activities and pile driving, among others. Using the vibration source level of construction equipment provided on Table 6-9 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. The construction vibration analysis is based on the shortest distance to either Project site construction or Excess Fill Dirt Site soil import/export activities. Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference level of 0.089 in/sec PPV at a distance of 25 feet. At distances ranging from 332 to 1,494 feet from the Project site, construction vibration levels are expected to range from 0.000 to 0.002 in/sec PPV. In order to assess the human perception of vibration levels in PPV, as previously discussed in Section 3.6.2, the velocities are converted to RMS vibration levels based on the Caltrans *Transportation and Construction Vibration Guidance Manual* conversion factor of 0.71. Table 11-9 shows the construction vibration levels in RMS are expected to range from 0.000 to 0.001 in/sec (RMS) at the five receiver locations. Based on the City of Corona vibration standards, the proposed Project site will not include or require equipment, facilities, or activities that would result in a human response (annoyance).

The Project construction is not expected to generate vibration levels exceeding the City of Corona maximum acceptable vibration standard of 0.05 in/sec (RMS). Further, impacts at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period, but will occur rather only during the times that heavy construction equipment is operating proximate to the Project site perimeter. Moreover, 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. On this basis the potential for the Project to result in exposure of persons to, or generation of, excessive ground-borne vibration is determined to be *less than significant*.

TABLE 11-12: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver Location[1]	Distance To Property Line (In Feet)	Receiver PPV Levels (in/sec)[2]					RMS Velocity Levels[3] (in/sec)	Potential Significant Impact?[4]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Peak Vibration		
R1	332'	0.0001	0.0007	0.0016	0.0018	0.002	0.001	No
R2	1,383'	0.0000	0.0001	0.0002	0.0002	0.000	0.000	No
R3	1,303'	0.0000	0.0001	0.0002	0.0002	0.000	0.000	No
R4	1,361'	0.0000	0.0001	0.0002	0.0002	0.000	0.000	No
R5	1,494'	0.0000	0.0001	0.0002	0.0002	0.000	0.000	No

[1] Noise receiver locations are shown on Exhibit 11-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-9.
[3] Vibration levels in PPV are converted to RMS velocity using a 0.71 conversion factor identified in the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.
[4] Does the Peak Vibration exceed the City of Corona maximum acceptable vibration standard of 0.05 in/sec?

12 REFERENCES

1. **Urban Crossroads, Inc.** *Bedford Marketplace Traffic Study.* September 2019.
2. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
3. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
4. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
5. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
6. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
7. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
8. **Office of Planning and Research.** *State of California General Plan Guidelines.* 2018.
9. **State of California.** *California Green Building Standards Code.* 2019.
10. **City of Corona.** *General Plan Public Health and Safety Element - Noise.* March 2004.
11. —. *Municipal Code, Section 17.84.040 Noise.*
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13. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
14. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
15. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* May 2006. FTA-VA-90-1003-06.
16. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
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18. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
19. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* June, 1995.
20. **California Department of Transportation.** *Traffic Noise Analysis Protocol.* May 2011.
21. **Urban Crossroads, Inc.** *Bedford Marketplace Air Quality Impact Analysis.* November 2019.

13 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Bedford Marketplace 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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EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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

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APPENDIX 3.1:

CITY OF CORONA MUNICIPAL CODE

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CHAPTER 17.84
PERFORMANCE STANDARDS

Sections

17.84.010 Compliance required.

All uses established or placed into operation after the effective date of the ordinance codified in this title shall comply at all times hereafter with the following limitations or performance standards. All uses actually established and in operation on the effective date of the ordinance codified in this title shall be made to comply with the limitations or performance standards set forth in this chapter on or before January 3, 1967 and shall comply at all times thereafter.

(`78 Code, § 17.84.010.) (Ord. 2161 § 1 (part), 1993.)

17.84.020 Fire and explosion hazards.

The storage and handling of flammable liquids, liquified petroleum, gases and explosives shall comply with the state rules and regulations and ordinances of the city.

(`78 Code, § 17.84.020.) (Ord. 2161 § 1 (part), 1993.)

17.84.030 Radio-frequency energy or electrical disturbance.

Devices which radiate radio-frequency energy shall be so operated as not to cause interference with any activity carried on beyond the boundary line of the property upon which the device is located. Radio-frequency energy is electromagnetic energy at any frequency in the radio spectrum between ten kilocycles and three million megacycles.

(`78 Code, § 17.84.030.) (Ord. 2161 § 1 (part), 1993.)

17.84.040 Noise.

(A) **Purpose and intent**.

(1) The purpose of this section is to regulate noise and vibration in the interest of the public health, safety and general welfare. The city finds that certain noise levels and vibrations are detrimental to the public health, safety and general welfare and that the primary sources of noise in the city are freeways, highways, manufacturing uses, railroads, the airport and construction noise. The noise element of the General Plan contains the city's policies regarding noise and identifies noise contours for existing and future roadways and the Corona Municipal Airport, which are implemented by this chapter. The General Plan noise element shall govern all noise standards and policies.

(2) In order to control unnecessary, excessive and annoying noise and vibration in the city, it is hereby declared to be the policy of the city to prohibit such noise and vibration generated from or by all sources as specified in this chapter. It shall be the policy of the city to maintain quiet in those areas which exhibit low noise levels and to implement programs to reduce noise in those areas within the city where noise levels are above acceptable values. It is the intent of the city to minimize noise impacts to adjacent land uses pursuant to the standards identified herein.

(B) **Definitions**. Terms found in this chapter shall be defined as follows. Additional definitions are found in the noise element of the General Plan.

(1) "**A-weighted sound level**." The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter network is designed to simulate the response of the human ear. The A-weighted sound level is expressed by the symbol dBA.

(2) "**Ambient noise**." The composite of noise from all existing sources near and far. The ambient noise level constitutes the normal or existing level of environmental noise at a given location, excluding any alleged offensive noise.

(3) "**Cumulative period**." An additive period of time composed of individual time segments which may be continuous or interrupted.

(4) "**Community noise equivalent level (CNEL)**." The average equivalent A-weighted sound level during a 24 hour day, obtained after addition of five decibels to sound levels between 7:00 p.m. and 10:00 p.m. and the addition of ten decibels to sound levels between 10:00 p.m. and 7:00 a.m.

(5) "**Decibel (dB)**." A unit for measuring the amplitude 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.

(6) "**Impulsive noise**." A noise of short duration, usually less than one second, and of high intensity, with an abrupt onset and rapid decay.

(7) "**Noise study**." An acoustical analysis performed by a qualified noise engineer which determines the potential noise impacts of a roadway, land use or operation of equipment. The noise study will generate noise contours and recommend mitigation for noise impacts which exceed the city's noise standards.

(8) "**Sensitive land uses**." Those specific land uses which have associated human activities that may be subject to stress or significant interference from noise. Sensitive land uses include single family residential, multiple family residential, churches, hospitals and similar health care institutions, convalescent homes, libraries and school classroom areas.

(9) “**Simple tone noise**.” A noise characterized by a predominant frequency or frequencies so that other frequencies cannot be readily distinguished. When measured, a simple tone noise shall exist if the one-third octave band sound pressure levels in the band with the tone exceeds the arithmetic average of the sound pressure levels of the two continuous one-third octave bands as follows: 5 dB for frequencies of 500 hertz or above or by 15 dB for frequencies less than or equal to 125 hertz.

(10) “**Sound attenuation device**.” An enclosure, blanket, vault, box, wall, fence, panel, baffle, coating, material, silencer, or other appurtenance, mechanism, or device intended to reduce the noise level of mechanical equipment.

(C) **Noise standards**.

(1) The noise ordinance identifies two separate types of noise sources: transportation and stationary. Transportation related noise sources, such as freeways, airports and railroads, are identified within this chapter and are mainly for the planning stages of project development. The noise metrics used for this noise type is the Community Noise Equivalent Level (CNEL) which is a 24 hour time weighted average noise level. The other type of noise standard is for stationary noise sources, such as industrial or construction noise, that may be intrusive to a neighboring private property. The noise metric used for stationary sources is defined as noise levels that cannot be exceeded for certain percentages of time. The noise standards shown in Table 1 are for regulating the impact of stationary noise sources to a neighboring private property. Standards for transportation related noise are found in Table 2.

(2) Stationary noise sources.

TABLE 1
STATIONARY NOISE SOURCE STANDARDS

TYPE OF LAND USE	MAXIMUM ALLOWABLE NOISE LEVELS			
	Exterior Noise Level		Interior Noise Level	
	7 a.m. to 10 p.m.	10 p.m. to 7 a.m.	7 a.m. to 10 p.m.	10 p.m. to 7 a.m.
Single-, Double- and Multi- Family Residential	55 dBA	50 dBA	45 dBA	35 dBA
Other Sensitive Land Uses	55 dBA	50 dBA	45 dBA	35 dBA
Commercial Uses	65 dBA	60 dBA	Not applicable	Not applicable
Industrial, Manufacturing or Agricultural	75 dBA	70 dBA	Not applicable	Not applicable

(a) Each of the noise limits specified here shall be reduced by 5 dBA for impulse or simple tone noises; provided, however, that if the ambient noise level exceeds the resulting standards, the ambient shall be the standard.

(b) If the measurement location is on the boundary between two different zones, the lower noise level standard applicable to the zone shall apply.

(c) If the intruding noise is continuous and cannot be reasonably discontinued or stopped for a time period whereby the ambient noise level can be determined, the measured noise level

obtained while the source is in operation shall be compared directly to the allowable noise level standards as specified respective to the measurement location's designated land use and for the time of the day the noise level is measured. The reasonableness of temporarily discontinuing the noise generation by an intruding noise source shall be determined by the Code Enforcement Officer for the purpose of establishing the existing ambient noise level at the measurement location.

(d) Exterior noise:

1. It shall be unlawful for any person, entity or operation at any location within the incorporated area of the city to create any noise, or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level when measured on any other property to exceed:

a. The noise standard for a cumulative period of more than 30 minutes in any hour;

b. The noise standard plus 5 dB for a cumulative period of more than 15 minutes in any hour;

c. The noise standard plus 10 dB for a cumulative period of more than five minutes in any hour;

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

e. The noise standard plus 20 dB for any period of time.

2. In the event the ambient noise level exceeds any of the first four noise limit categories above, the cumulative period applicable to the category shall be increased to reflect the ambient noise level. In the event the ambient noise level exceeds the fifth noise category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

(e) Interior noise. It shall be unlawful for any person at any location within the incorporated area of the city to create any noise or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such a person which causes the noise level when measured within any other residential dwelling unit or sensitive land use to exceed:

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

2. The noise standard plus 5 dB for a cumulative period of more than one minute in any hour; or

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

(3) Transportation noise sources.

TABLE 2
TRANSPORTATION NOISE SOURCE STANDARDS

TYPE OF LAND USE	**EXTERIOR NOISE LEVEL**	**INTERIOR NOISE LEVEL**
	(Private Outdoor Living Areas)	
Residential (Roadway)	65 CNEL	45 CNEL
Residential (Airport)	65 CNEL	45 CNEL
Other sensitive land uses	65 CNEL	45 CNEL

(Roadway)		
Other sensitive land uses (Airport)	65 CNEL	45 CNEL
Hotels/Motels (Roadway)	65 CNEL	45 CNEL
Hotels/Motels (Airport)	65 CNEL	45 CNEL

(a) **Roadway noise**. A noise study shall be performed prior to the construction of new master planned roads, roadway improvements, rail lines and/or prior to the construction of residential or sensitive land uses adjacent to existing or master planned roads or railways. The noise study shall identify the existing and future noise contours for the roadway and propose mitigation measures to reduce the noise impacts to a maximum of 65 dBA CNEL in the private outdoor living area of residences and to a maximum interior noise level of 45 dBA CNEL for residential and sensitive land uses, as shown in Table 2.

(b) **Airport noise**. Sensitive land uses, site-built homes and institutional uses are prohibited in airport noise contours above 65 dBA CNEL. All subdivisions within two miles of the Corona Municipal Airport or within the 65 dBA CNEL contour shall show and record an avigation easement for the benefit of the airport. The avigation easement shall provide notification to potential buyers and occupants of the presence of the easement and the potential for over flights and aircraft noise.

(D) **Special provisions**.

(1) **Mechanical equipment in residential zones.** Upon application for a building permit to install mechanical equipment, such as air conditioner and pool equipment, in a residential zone, the equipment shall be setback at least ten feet from an adjoining property line except where a five foot high block sound wall is maintained extending a distance of two feet on each side of such equipment and situated either between such equipment and the property line or on said property line. Exception: Mechanical equipment in residential zones shall be permitted closer than ten feet from an adjoining property line without a five foot high block sound wall when sound attenuation devices approved by the Building Official are installed. The noise level with sound attenuation devices installed shall comply with the limits and conditions specified in § 17.84.040(C)(2) when measured from any adjoining property. The approved sound attenuation devices shall be maintained and any approvals shall not be construed to permit violations of this code.

(2) **Construction noise**. Construction noise is prohibited between the hours of 8:00 p.m. to 7:00 a.m., Monday through Saturday and 6:00 p.m. to 10:00 a.m. on Sundays and federal holidays. Construction noise is defined as noise which is disturbing, excessive or offensive and constitutes a nuisance involving discomfort or annoyance to persons of normal sensitivity residing in the area, which is generated by the use of any tools, machinery or equipment used in connection with construction operations.

(3) **Noise devices**. In accordance with Chapter 9.24, no loudspeaker, bells, gongs, buzzers, mechanical equipment or other sounds, attention-attracting or communication device associated with any use adjacent to residential or sensitive land uses shall be discernible beyond the boundary line of the parcel, except fire protection devices, burglar alarms and church bells. Noise generated by these sources shall be enforced by the Police Department.

(4) **Noisy animals**. Noise generated by animals shall be regulated by the Police Department in accordance with Chapter 6.11.

(E) **Exemptions**. The following activities shall be exempt from these noise standards:

(1) Special events pursuant to an approved special use permit. Noise impacts shall be evaluated and conditioned as part of the special use permit;

(2) Filming pursuant to a film permit. Noise impacts shall be evaluated and conditioned as part of the film permit;

(3) Activities conducted on public parks, public playgrounds and public or private school grounds, including school athletic and entertainment events that are conducted under the sanction of the school or which a license or permit has been duly issued pursuant to any provision of city code;

(4) Noise sources associated with the maintenance of real property, provided the activities take place between the hours of 7:00 a.m. to 8:00 p.m. on any day except Sunday or between the hours of 9:00 a.m. to 8:00 p.m. on Sunday;

(5) Any activity too the extent regulation thereof has been preempted by state or federal law;

(6) Repairs to and replacement of mechanical equipment in residential zones installed by permit prior to May 20, 1993 shall be exempt from the requirements in division (D) of this section;

(7) Noise variances granted pursuant to subsection (H)(1) below;

(8) Short-term, non-continuous operations associated with government and public utility facilities that are necessary to maintain the delivery of services for the benefit of public health and safety.

(F) **Noise level measurements**. All noise shall be measured in accordance with the following standards. Measurements shall be taken of the ambient noise level and any alleged offensive noise. If the measurement location is on the boundary of two different noise zones, the lower noise level standard shall apply.

(1) **Sound level meter**. A sound level meter shall mean an instrument meeting the American National Standards Institute's S1.4 - 1971 for Type 1 sound level meters or an instrument and the associated recording and analyzing equipment which will provide equivalent data.

(2) **Ambient noise**. A measurement of the ambient noise level shall be taken according to the procedures in this chapter. If the ambient noise level exceeds the standard, the ambient level shall be the standard. If an alleged intruding noise source is continuous and cannot be reasonably discontinued or stopped for a time period whereby the ambient noise level can be determined, the measured noise level obtained while the alleged intruding noise source is in operation shall be compared directly to the applicable noise level standard.

(G) **Noise studies required**. As referenced in division (C) of this section, there are essentially two different types of noise sources that have been identified in Corona and each has its own noise metrics as well as its own required noise studies. The noise metrics used for transportation related noise sources is the CNEL which is a 24 hour time weighted average noise level. The noise metrics used for stationary sources are defined as noise levels that cannot be exceeded for certain percentages of time.

(1) **Predevelopment noise studies**. A predevelopment noise study is performed prior to development and is designed to project future noise levels and recommend mitigation measures to be implemented in project development. All noise studies shall be prepared by a registered noise engineer as approved by the city. Noise studies will be required for the construction of master planned roadways, for development adjacent to master planned roadways, when a noise generating use, such as a factory, is proposed in proximity to residential uses and when residential uses are proposed in proximity to an existing noise source. The need for a noise study will be determined at development plan review. Predevelopment noise studies shall project future noise levels based on proposed uses, traffic volumes and other relevant future conditions. Existing and projected noise shall be evaluated pursuant to the noise standards within this chapter and the noise element of the General Plan. Mitigation measures shall be proposed to bring noise levels into compliance with these standards. Mitigation measures may consist of

walls, berms, setbacks, landscaping, building materials, construction methods and any other means whereby noise can be reduced to the maximum amounts within this chapter.

(2) **Studies of existing stationary noise**. At times it will be necessary to study the noise generated by an existing source, either due to alleged violations of the noise ordinance or for monitoring purposes. These noise studies shall be prepared by a registered noise engineer as approved by the city in accordance with the standards in Table 1.

(H) **Noise variance**.

(1) The owner or operator of a noise or vibration source which violates any of the provisions of this chapter may file an application with the Community Development Department for a variance from the provisions thereof wherein said owner or operator shall set forth all actions taken to comply with the provisions, the reasons why immediate compliance cannot be achieved, a proposed method of achieving compliance and a proposed time schedule for its accomplishment. The application shall be accompanied by a fee as determined by City Council resolution. A separate application shall be filed for each noise source; provided, however, that several fixed sources on a single property may be combined into one application. An application for a variance shall remain subject to prosecution under the terms of this chapter until a variance is granted.

(2) The Board of Zoning Adjustment shall evaluate all applications for variance from the requirements of this chapter and may grant the variances with respect to time for compliance, subject to such terms, conditions and requirements as it may deem reasonable to achieve maximum compliance with the provisions of this chapter. The terms, conditions and requirements may include, but shall not be limited to, limitations on noise levels and operating hours. Each such variance shall set forth in detail the approved method of achieving maximum compliance and a time schedule for its accomplishment. In its determinations, the Board shall consider the following:

(a) The magnitude of the nuisance caused by the offensive noise;

(b) The uses of property within the area of impingement by the noise;

(c) The time factors related to study, design, financing and construction of remedial work;

(d) The economic factors related to age and useful life of the equipment;

(e) The general public interest, welfare and safety.

(3) Any variance granted by the Board shall be by resolution and shall be transmitted to the Code Enforcement Officer for enforcement. Any violation of the terms of the variance shall be unlawful and enforced pursuant to division (I) of this section.

(I) **Enforcement**.

(1) It shall be unlawful for any person at any location within the City of Corona to create any exterior noise or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level when measured according to this chapter to exceed the maximum allowable noise levels in Table 1 of § 17.84.040(C).

(2) No person shall interfere with, oppose or resist any authorized person charged with the enforcement of this chapter while such person is engaged in the performance of his or her duty.

(3) Any person violating any provision of this chapter shall be deemed guilty of a misdemeanor.

(4) The operation or maintenance of any device, instrument, vehicle or machinery in violation of any noise standard identified in this chapter is declared to be a public nuisance and may be

abated pursuant to the nuisance abatement procedure in Chapter 8.32 of this code.

(5) Pursuant to § 1.08.020(A) of this code, each person shall be deemed guilty of a separate offense for each and every day during any portion of which any violation of any provision of this chapter is committed, continued or permitted by such person and shall be punished accordingly.

(`78 Code, § 17.84.040.) (Ord. 3277 §§ 4, 5, 2018; Ord. 3188 § 3, 2015; Ord. 2372 § 2, 1999; Ord. 2161 § 1 (part), 1993.)

17.84.050 Vibration.

It shall be unlawful for any person to create, maintain or cause any ground vibration which is perceptible without instruments at any point on any affected property adjoining the property on which the vibration source is located. For the purposes of this section, the perception threshold shall be presumed to be more than 0.05 inches per second RMS vertical velocity.

(`78 Code, § 17.84.050.) (Ord. 2161 § 1 (part), 1993.)

17.84.060 Dust, smoke, glare – Emission.

The emission of dust, odor, smoke and glare shall conform to the standards established by the South Coast Air Quality Management District. Every use shall be so operated that it does not emit dust, odor, heat or glare in such quantities or degree as to be readily detectable on any boundary line of the lot on which the use is located.

(`78 Code, § 17.84.060.) (Ord. 2161 § 1 (part), 1993.)

17.84.070 Glare.

Glare from arc welding, acetylene torch cutting or similar processes shall be performed so as not to be seen from any point beyond the boundary line of the property. All areas of exterior lighting shall be designed to direct light downward with minimal spillover onto adjacent residences, sensitive land uses and open space.

(`78 Code, § 17.84.070.) (Ord. 2161 § 1 (part), 1993.)

17.84.080 Underground storage tanks.

Notwithstanding any provision of this code to the contrary, no underground tank for the storage of any type of chemical, gasoline, fuel, oil or other petroleum product shall be constructed within 500 feet of a well owned or operated by the City of Corona which supplies drinking water. Reconstruction or replacement of any underground storage tank, basin, or skimming pond existing within 500 feet of a well supplying drinking water as of the effective date of this chapter shall be subject to the review and approval of the General Manager of the Department of Water and Power, or his or her designee. The General Manager shall require:

(A) Testing of the tank site to ascertain whether contamination exists, and at what depth;

(B) That all testing and analysis be performed in accordance with California Environmental Protection Agency and U.S. Environment Protection Agency standards and methods by a qualified person, with laboratory certification of the test results; and

(C) That the removal or reconstruction of the existing tank and installation of any new tank be undertaken in strict compliance with all applicable federal, state, and local statutes, regulations, standards, and requirements.

(Ord. 2971 § 1 (part), 2009.)

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APPENDIX 5.1:

STUDY AREA PHOTOS

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JN: 12751 Study Area Photos

L1
,

L1_E
33, 49' 14.440000", 117, 31' 24.540000"

L1_N
33, 49' 14.210000", 117, 31' 25.420000"

L1_S
33, 49' 14.330000", 117, 31' 25.720000"

L1_W
33, 49' 14.360000", 117, 31' 25.360000"

L2
33, 49' 10.790000", 117, 31' 22.320000"

L2_E
33, 49' 10.910000", 117, 31' 22.260000"

L2_N
33, 49' 10.800000", 117, 31' 22.180000"

L2_S
33, 49' 10.910000", 117, 31' 22.400000"

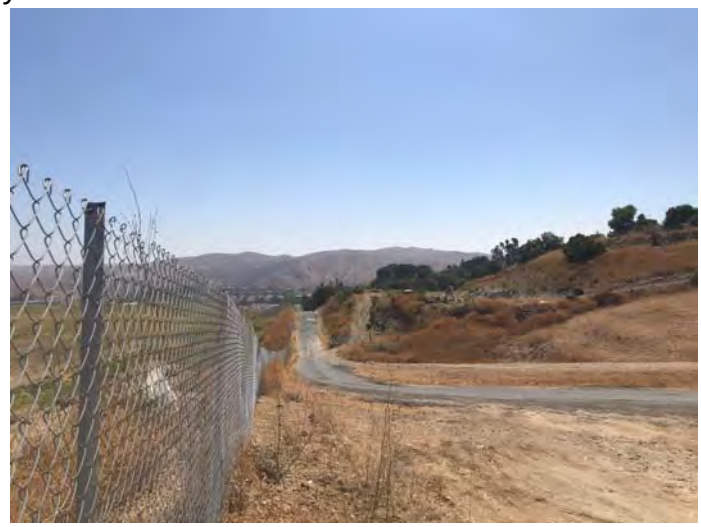
L2_W
33, 49' 10.760000", 117, 31' 22.320000"

L3
33, 48' 53.010000", 117, 31' 6.990000"

L3_E
33, 48' 53.070000", 117, 31' 6.990000"

JN: 12751 Study Area Photos

L3_N
33, 48' 53.010000", 117, 31' 6.990000"



L3_S
33, 48' 52.950000", 117, 31' 7.210000"

L3_W
33, 48' 53.060000", 117, 31' 7.540000"

L4
33, 48' 52.900000", 117, 30' 59.160000"

L4_E
33, 48' 53.030000", 117, 30' 58.940000"

L4_N
33, 48' 52.430000", 117, 30' 54.330000"

JN: 12751 Study Area Photos

L4_S
33, 48' 52.940000", 117, 30' 59.000000"

L4_W
33, 48' 52.950000", 117, 30' 59.130000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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24-Hour Noise Level Measurement Summary

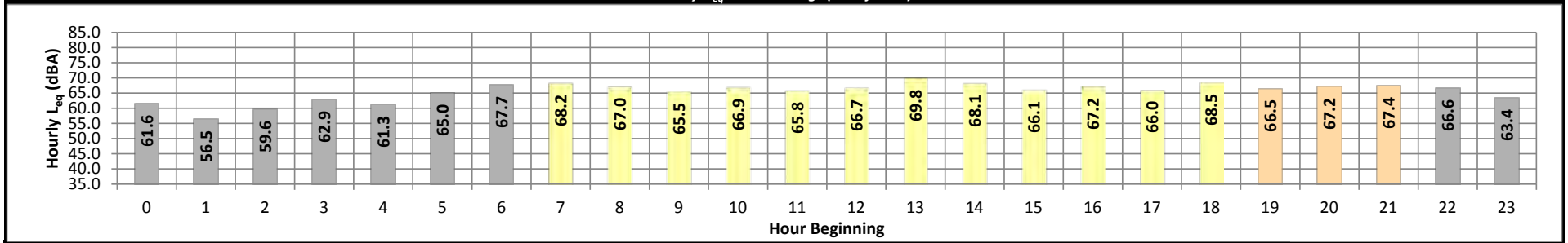
Date: Friday, August 02, 2019
Project: Bedford Marketplace

Location: L1 - Located northwest of Project site on Eagle Glen Parkway and Bedford Canyon Road near existing residential homes.

Meter: Piccolo I

JN: 12751
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	61.6	84.8	42.1	73.0	70.0	67.0	64.0	56.0	50.0	45.0	44.0	43.0	61.6	10.0	71.6
	1	56.5	81.4	40.7	68.0	65.0	60.0	57.0	50.0	47.0	43.0	42.0	41.0	56.5	10.0	66.5
	2	59.6	83.5	43.7	69.0	67.0	66.0	65.0	52.0	49.0	46.0	45.0	44.0	59.6	10.0	69.6
	3	62.9	92.5	46.8	72.0	69.0	64.0	60.0	55.0	52.0	49.0	49.0	47.0	62.9	10.0	72.9
	4	61.3	77.2	49.9	72.0	70.0	67.0	66.0	58.0	55.0	52.0	52.0	51.0	61.3	10.0	71.3
	5	65.0	86.2	50.3	76.0	73.0	70.0	69.0	63.0	58.0	54.0	53.0	51.0	65.0	10.0	75.0
	6	67.7	89.1	52.3	78.0	76.0	72.0	71.0	67.0	61.0	57.0	56.0	55.0	67.7	10.0	77.7
Day	7	68.2	94.0	50.7	78.0	76.0	72.0	71.0	65.0	61.0	56.0	55.0	54.0	68.2	0.0	68.2
	8	67.0	86.9	50.1	78.0	75.0	71.0	70.0	65.0	61.0	55.0	54.0	52.0	67.0	0.0	67.0
	9	65.5	81.8	49.8	76.0	73.0	70.0	69.0	64.0	60.0	55.0	54.0	52.0	65.5	0.0	65.5
	10	66.9	89.1	50.3	77.0	75.0	71.0	69.0	65.0	60.0	55.0	54.0	52.0	66.9	0.0	66.9
	11	65.8	86.3	50.3	76.0	74.0	70.0	69.0	64.0	60.0	55.0	55.0	53.0	65.8	0.0	65.8
	12	66.7	88.9	49.8	78.0	75.0	71.0	69.0	65.0	61.0	55.0	54.0	52.0	66.7	0.0	66.7
	13	69.8	97.2	50.0	79.0	75.0	71.0	69.0	65.0	60.0	54.0	53.0	51.0	69.8	0.0	69.8
	14	68.1	91.4	50.8	78.0	75.0	71.0	69.0	65.0	60.0	55.0	55.0	53.0	68.1	0.0	68.1
	15	66.1	89.2	52.0	74.0	72.0	70.0	69.0	65.0	61.0	56.0	56.0	54.0	66.1	0.0	66.1
	16	67.2	89.2	53.6	79.0	75.0	71.0	69.0	64.0	61.0	57.0	56.0	55.0	67.2	0.0	67.2
	17	66.0	89.5	52.6	76.0	72.0	69.0	68.0	64.0	60.0	56.0	55.0	54.0	66.0	0.0	66.0
	18	68.5	95.5	51.3	74.0	72.0	69.0	68.0	64.0	60.0	55.0	54.0	52.0	68.5	0.0	68.5
Evening	19	66.5	91.0	47.4	77.0	74.0	70.0	68.0	64.0	59.0	54.0	53.0	49.0	66.5	5.0	71.5
	20	67.2	90.5	49.9	77.0	74.0	70.0	69.0	65.0	59.0	54.0	53.0	51.0	67.2	5.0	72.2
	21	67.4	92.5	48.3	77.0	74.0	71.0	70.0	66.0	60.0	53.0	51.0	50.0	67.4	5.0	72.4
Night	22	66.6	91.4	46.0	76.0	73.0	70.0	69.0	63.0	57.0	51.0	49.0	48.0	66.6	10.0	76.6
	23	63.4	86.6	45.0	74.0	72.0	69.0	67.0	60.0	54.0	48.0	47.0	46.0	63.4	10.0	73.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	65.5	81.8	49.8	74.0	72.0	69.0	68.0	64.0	60.0	54.0	53.0	51.0
	Max	69.8	97.2	53.6	79.0	76.0	72.0	71.0	65.0	61.0	57.0	56.0	55.0
Energy Average		67.3	Average:		76.9	74.1	70.5	69.1	64.6	60.4	55.3	54.6	52.8
Evening	Min	66.5	90.5	47.4	77.0	74.0	70.0	68.0	64.0	59.0	53.0	51.0	49.0
	Max	67.4	92.5	49.9	77.0	74.0	71.0	70.0	66.0	60.0	54.0	53.0	51.0
Energy Average		67.1	Average:		77.0	74.0	70.3	69.0	65.0	59.3	53.7	52.3	50.0
Night	Min	56.5	77.2	40.7	68.0	65.0	60.0	57.0	50.0	47.0	43.0	42.0	41.0
	Max	67.7	92.5	52.3	78.0	76.0	72.0	71.0	67.0	61.0	57.0	56.0	55.0
Energy Average		63.9	Average:		73.1	70.6	67.2	65.3	58.2	53.7	49.4	48.6	47.3

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
66.3	67.3	63.9

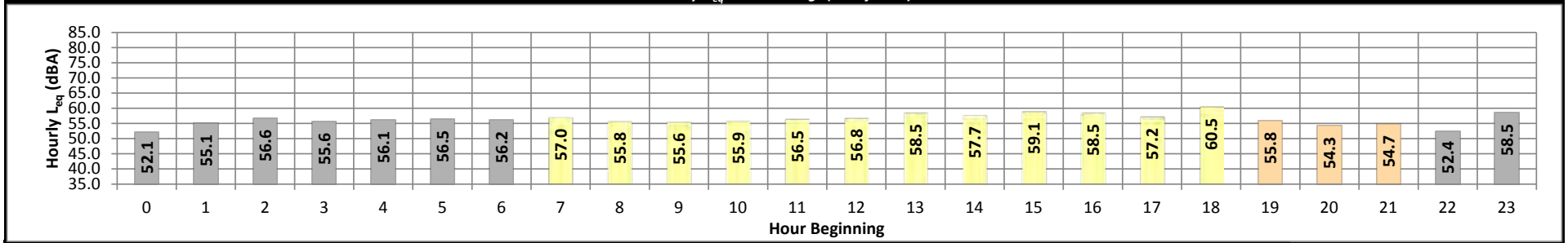
24-Hour CNEL (dBA)
71.4

24-Hour Noise Level Measurement Summary

Date: Friday, August 02, 2019 *Location:* L2 - Located west of the Project site near existing vacant dirt lot. *Meter:* Piccolo I *JN:* 12751

Project: Bedford Marketplace *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	52.1	75.5	43.3	60.0	57.0	54.0	52.0	50.0	48.0	46.0	45.0	44.0	52.1	10.0	62.1
	1	55.1	62.1	44.9	57.0	57.0	56.0	56.0	55.0	55.0	53.0	52.0	46.0	55.1	10.0	65.1
	2	56.6	72.1	46.2	70.0	69.0	55.0	53.0	51.0	50.0	48.0	48.0	47.0	56.6	10.0	66.6
	3	55.6	67.0	49.2	59.0	58.0	57.0	57.0	56.0	55.0	52.0	51.0	50.0	55.6	10.0	65.6
	4	56.1	64.7	51.3	60.0	59.0	58.0	58.0	56.0	55.0	53.0	53.0	52.0	56.1	10.0	66.1
	5	56.5	63.9	51.4	61.0	60.0	59.0	59.0	57.0	55.0	53.0	52.0	52.0	56.5	10.0	66.5
	6	56.2	66.2	53.1	59.0	59.0	58.0	57.0	56.0	55.0	54.0	54.0	53.0	56.2	10.0	66.2
Day	7	57.0	70.7	49.1	66.0	64.0	62.0	60.0	56.0	54.0	52.0	51.0	50.0	57.0	0.0	57.0
	8	55.8	73.7	49.2	64.0	61.0	59.0	58.0	55.0	54.0	52.0	51.0	50.0	55.8	0.0	55.8
	9	55.6	68.2	48.0	63.0	61.0	59.0	58.0	55.0	54.0	51.0	50.0	49.0	55.6	0.0	55.6
	10	55.9	65.7	50.0	62.0	61.0	58.0	57.0	56.0	55.0	53.0	52.0	51.0	55.9	0.0	55.9
	11	56.5	70.8	52.0	62.0	61.0	60.0	58.0	56.0	55.0	53.0	53.0	53.0	56.5	0.0	56.5
	12	56.8	66.7	51.3	63.0	62.0	59.0	58.0	57.0	55.0	54.0	53.0	52.0	56.8	0.0	56.8
	13	58.5	81.8	52.2	64.0	62.0	59.0	58.0	57.0	55.0	54.0	53.0	53.0	58.5	0.0	58.5
	14	57.7	74.4	52.2	65.0	63.0	60.0	59.0	57.0	56.0	54.0	54.0	53.0	57.7	0.0	57.7
	15	59.1	78.4	52.5	68.0	65.0	62.0	60.0	58.0	56.0	55.0	54.0	53.0	59.1	0.0	59.1
	16	58.5	77.2	52.6	65.0	63.0	61.0	60.0	57.0	56.0	55.0	54.0	53.0	58.5	0.0	58.5
	17	57.2	77.9	51.5	63.0	61.0	59.0	58.0	56.0	55.0	54.0	53.0	53.0	57.2	0.0	57.2
	18	60.5	86.1	51.3	63.0	61.0	59.0	58.0	56.0	55.0	54.0	53.0	52.0	60.5	0.0	60.5
Evening	19	55.8	71.4	49.8	64.0	63.0	60.0	58.0	55.0	53.0	51.0	51.0	50.0	55.8	5.0	60.8
	20	54.3	72.3	48.7	61.0	58.0	57.0	56.0	54.0	52.0	51.0	50.0	49.0	54.3	5.0	59.3
	21	54.7	79.2	46.2	61.0	59.0	56.0	55.0	53.0	51.0	49.0	49.0	47.0	54.7	5.0	59.7
Night	22	52.4	71.1	44.2	62.0	59.0	56.0	54.0	52.0	49.0	47.0	46.0	45.0	52.4	10.0	62.4
	23	58.5	83.0	43.1	72.0	59.0	53.0	52.0	49.0	47.0	45.0	45.0	44.0	58.5	10.0	68.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	55.6	65.7	48.0	62.0	61.0	58.0	57.0	55.0	54.0	51.0	50.0	49.0
	Max	60.5	86.1	52.6	68.0	65.0	62.0	60.0	58.0	56.0	55.0	54.0	53.0
Energy Average		57.7	Average:		64.0	62.1	59.8	58.5	56.3	55.0	53.4	52.6	51.8
Evening	Min	54.3	71.4	46.2	61.0	58.0	56.0	55.0	53.0	51.0	49.0	49.0	47.0
	Max	55.8	79.2	49.8	64.0	63.0	60.0	58.0	55.0	53.0	51.0	51.0	50.0
Energy Average		55.0	Average:		62.0	60.0	57.7	56.3	54.0	52.0	50.3	50.0	48.7
Night	Min	52.1	62.1	43.1	57.0	57.0	53.0	52.0	49.0	47.0	45.0	45.0	44.0
	Max	58.5	83.0	53.1	72.0	69.0	59.0	59.0	57.0	55.0	54.0	54.0	53.0
Energy Average		55.8	Average:		62.2	59.7	56.2	55.3	53.6	52.1	50.1	49.6	48.1

L_{eq} (dBA)

24-Hour	Daytime	Nighttime
56.8	57.3	55.8

24-Hour CNEL (dBA)

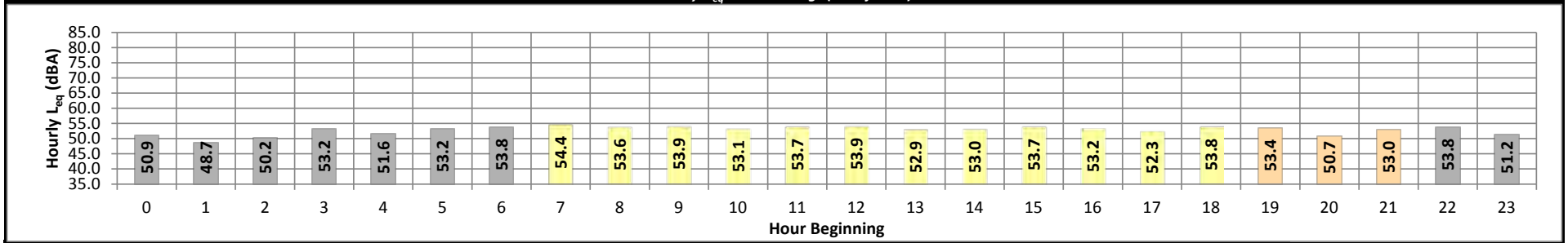
62.7

24-Hour Noise Level Measurement Summary

Date: Friday, August 02, 2019 *Location:* L3 - Located South of the project site on Glen Road and North Weirick Road near vacant land and existing residential homes. *Meter:* Piccolo I *JN:* 12751

Project: Bedford Marketplace *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	50.9	66.2	45.0	56.0	55.0	54.0	53.0	51.0	50.0	47.0	47.0	46.0	50.9	10.0	60.9
	1	48.7	60.0	43.5	53.0	52.0	51.0	50.0	49.0	48.0	46.0	46.0	45.0	48.7	10.0	58.7
	2	50.2	58.4	45.2	54.0	53.0	52.0	52.0	50.0	49.0	47.0	47.0	46.0	50.2	10.0	60.2
	3	53.2	61.7	47.5	59.0	58.0	56.0	55.0	53.0	52.0	50.0	50.0	49.0	53.2	10.0	63.2
	4	51.6	63.5	47.1	56.0	55.0	54.0	53.0	52.0	51.0	49.0	48.0	48.0	51.6	10.0	61.6
	5	53.2	60.7	49.0	56.0	56.0	55.0	54.0	53.0	52.0	51.0	50.0	50.0	53.2	10.0	63.2
	6	53.8	69.8	49.9	57.0	56.0	55.0	55.0	54.0	53.0	52.0	51.0	50.0	53.8	10.0	63.8
Day	7	54.4	71.7	49.9	62.0	60.0	57.0	56.0	54.0	53.0	51.0	51.0	50.0	54.4	0.0	54.4
	8	53.6	63.4	48.6	60.0	58.0	56.0	55.0	53.0	52.0	51.0	50.0	50.0	53.6	0.0	53.6
	9	53.9	73.1	48.5	60.0	58.0	56.0	56.0	53.0	52.0	50.0	50.0	49.0	53.9	0.0	53.9
	10	53.1	62.2	48.9	57.0	56.0	55.0	54.0	53.0	52.0	51.0	50.0	50.0	53.1	0.0	53.1
	11	53.7	62.3	49.3	58.0	57.0	56.0	55.0	54.0	53.0	51.0	51.0	50.0	53.7	0.0	53.7
	12	53.9	63.5	49.3	59.0	58.0	56.0	56.0	54.0	53.0	51.0	51.0	50.0	53.9	0.0	53.9
	13	52.9	69.8	48.3	57.0	56.0	55.0	54.0	53.0	52.0	50.0	50.0	49.0	52.9	0.0	52.9
	14	53.0	69.9	47.5	62.0	58.0	55.0	54.0	52.0	51.0	49.0	49.0	48.0	53.0	0.0	53.0
	15	53.7	67.0	48.6	61.0	58.0	56.0	55.0	53.0	52.0	50.0	50.0	49.0	53.7	0.0	53.7
	16	53.2	62.9	48.4	58.0	57.0	56.0	55.0	53.0	52.0	50.0	50.0	49.0	53.2	0.0	53.2
	17	52.3	63.0	48.2	56.0	55.0	54.0	54.0	52.0	51.0	50.0	50.0	49.0	52.3	0.0	52.3
	18	53.8	63.3	50.4	59.0	57.0	56.0	55.0	54.0	53.0	51.0	51.0	51.0	53.8	0.0	53.8
Evening	19	53.4	64.9	48.6	60.0	58.0	56.0	55.0	53.0	52.0	50.0	50.0	49.0	53.4	5.0	58.4
	20	50.7	57.7	47.2	54.0	53.0	52.0	52.0	51.0	50.0	48.0	48.0	47.0	50.7	5.0	55.7
	21	53.0	65.8	47.0	58.0	57.0	55.0	55.0	53.0	52.0	50.0	49.0	48.0	53.0	5.0	58.0
Night	22	53.8	70.4	48.0	61.0	59.0	56.0	55.0	53.0	52.0	50.0	50.0	49.0	53.8	10.0	63.8
	23	51.2	64.5	46.5	56.0	55.0	54.0	53.0	51.0	50.0	48.0	48.0	47.0	51.2	10.0	61.2

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	52.3	62.2	47.5	56.0	55.0	54.0	54.0	52.0	51.0	49.0	49.0	48.0
	Max	54.4	73.1	50.4	62.0	60.0	57.0	56.0	54.0	53.0	51.0	51.0	51.0
Energy Average		53.5	Average:		59.1	57.3	55.7	54.9	53.2	52.2	50.4	50.3	49.5
Evening	Min	50.7	57.7	47.0	54.0	53.0	52.0	52.0	51.0	50.0	48.0	48.0	47.0
	Max	53.4	65.8	48.6	60.0	58.0	56.0	55.0	53.0	52.0	50.0	50.0	49.0
Energy Average		52.5	Average:		57.3	56.0	54.3	54.0	52.3	51.3	49.3	49.0	48.0
Night	Min	48.7	58.4	43.5	53.0	52.0	51.0	50.0	49.0	48.0	46.0	46.0	45.0
	Max	53.8	70.4	49.9	61.0	59.0	56.0	55.0	54.0	53.0	52.0	51.0	50.0
Energy Average		52.1	Average:		56.4	55.4	54.1	53.3	51.8	50.8	48.9	48.6	47.8

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
52.9	53.3	52.1

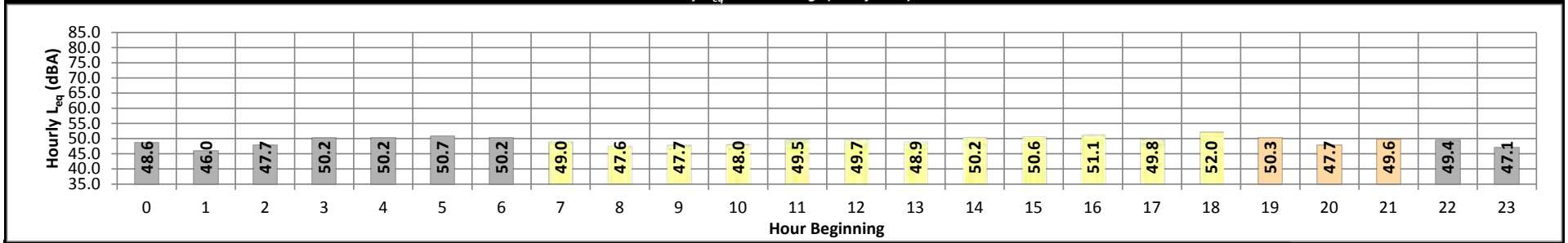
24-Hour CNEL (dBA)
59.0

24-Hour Noise Level Measurement Summary

Date: Friday, August 02, 2019 *Location:* L4 -Located southeast of the Project site on Glen Road near existing residential homes and vacant lot. *Meter:* Piccolo I *JN:* 12751

Project: Bedford Marketplace *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	48.6	55.6	43.2	53.0	53.0	52.0	51.0	49.0	47.0	45.0	45.0	44.0	48.6	10.0	58.6
	1	46.0	55.6	41.9	50.0	49.0	48.0	48.0	46.0	45.0	43.0	43.0	42.0	46.0	10.0	56.0
	2	47.7	57.6	43.5	51.0	51.0	50.0	49.0	48.0	47.0	45.0	45.0	44.0	47.7	10.0	57.7
	3	50.2	63.4	45.5	54.0	53.0	52.0	52.0	50.0	49.0	47.0	47.0	46.0	50.2	10.0	60.2
	4	50.2	65.0	44.8	55.0	54.0	53.0	53.0	50.0	48.0	47.0	46.0	45.0	50.2	10.0	60.2
	5	50.7	68.9	46.8	54.0	53.0	52.0	52.0	51.0	50.0	48.0	48.0	47.0	50.7	10.0	60.7
	6	50.2	63.0	43.7	55.0	53.0	52.0	52.0	51.0	49.0	46.0	46.0	44.0	50.2	10.0	60.2
Day	7	49.0	65.2	41.9	58.0	56.0	53.0	51.0	48.0	46.0	43.0	43.0	42.0	49.0	0.0	49.0
	8	47.6	64.0	41.8	58.0	55.0	50.0	49.0	46.0	44.0	43.0	43.0	42.0	47.6	0.0	47.6
	9	47.7	68.4	40.7	57.0	55.0	52.0	50.0	46.0	44.0	42.0	42.0	42.0	47.7	0.0	47.7
	10	48.0	62.4	43.0	55.0	52.0	50.0	49.0	48.0	47.0	45.0	45.0	43.0	48.0	0.0	48.0
	11	49.5	64.5	44.4	57.0	55.0	53.0	52.0	49.0	47.0	46.0	45.0	45.0	49.5	0.0	49.5
	12	49.7	66.3	44.3	57.0	56.0	53.0	51.0	49.0	48.0	46.0	45.0	45.0	49.7	0.0	49.7
	13	48.9	66.5	44.2	54.0	52.0	51.0	50.0	49.0	48.0	46.0	45.0	45.0	48.9	0.0	48.9
	14	50.2	69.7	44.3	59.0	56.0	52.0	51.0	49.0	48.0	46.0	45.0	45.0	50.2	0.0	50.2
	15	50.6	64.2	44.9	58.0	55.0	53.0	52.0	50.0	49.0	47.0	47.0	46.0	50.6	0.0	50.6
	16	51.1	64.4	46.6	57.0	56.0	54.0	53.0	51.0	50.0	48.0	48.0	47.0	51.1	0.0	51.1
	17	49.8	62.2	45.6	54.0	53.0	51.0	51.0	50.0	49.0	48.0	47.0	47.0	49.8	0.0	49.8
	18	52.0	72.1	47.4	58.0	56.0	54.0	53.0	51.0	50.0	49.0	48.0	48.0	52.0	0.0	52.0
Evening	19	50.3	62.8	45.8	57.0	55.0	53.0	52.0	50.0	49.0	47.0	47.0	46.0	50.3	5.0	55.3
	20	47.7	58.4	42.1	52.0	51.0	50.0	49.0	48.0	47.0	45.0	44.0	43.0	47.7	5.0	52.7
	21	49.6	58.4	43.5	53.0	52.0	51.0	51.0	50.0	49.0	47.0	46.0	45.0	49.6	5.0	54.6
Night	22	49.4	60.3	45.3	53.0	52.0	51.0	51.0	50.0	48.0	47.0	46.0	46.0	49.4	10.0	59.4
	23	47.1	53.6	41.1	51.0	51.0	50.0	49.0	47.0	46.0	44.0	44.0	43.0	47.1	10.0	57.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	47.6	62.2	40.7	54.0	52.0	50.0	49.0	46.0	44.0	42.0	42.0	42.0
	Max	52.0	72.1	47.4	59.0	56.0	54.0	53.0	51.0	50.0	49.0	48.0	48.0
Energy Average		49.7	Average:		56.8	54.8	52.2	51.0	48.8	47.5	45.8	45.3	44.8
Evening	Min	47.7	58.4	42.1	52.0	51.0	50.0	49.0	48.0	47.0	45.0	44.0	43.0
	Max	50.3	62.8	45.8	57.0	55.0	53.0	52.0	50.0	49.0	47.0	47.0	46.0
Energy Average		49.3	Average:		54.0	52.7	51.3	50.7	49.3	48.3	46.3	45.7	44.7
Night	Min	46.0	53.6	41.1	50.0	49.0	48.0	48.0	46.0	45.0	43.0	43.0	42.0
	Max	50.7	68.9	46.8	55.0	54.0	53.0	53.0	51.0	50.0	48.0	48.0	47.0
Energy Average		49.2	Average:		52.9	52.1	51.1	50.8	49.1	47.7	45.8	45.6	44.6

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
49.5	**49.6**	**49.2**

24-Hour CNEL (dBA)

55.9

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Bedford Marketplace
Road Name: Masters Dr. | Job Number: 12751
Road Segment: n/o California Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,452 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	445 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-4.95	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-22.19	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-26.15	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.8	60.9	59.2	53.1	61.7	62.3
Medium Trucks:	56.9	55.3	49.0	47.4	55.9	56.1
Heavy Trucks:	58.2	56.7	47.7	49.0	57.3	57.4
Vehicle Noise:	64.9	63.1	59.8	55.3	63.8	64.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	28	61	132
CNEL:	14	30	66	141

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Bedford Marketplace
Road Name: Masters Dr. | Job Number: 12751
Road Segment: s/o California Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,364 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	936 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.72	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-18.96	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-22.92	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.2	62.4	56.3	65.0	65.6
Medium Trucks:	60.1	58.6	52.2	50.7	59.1	59.4
Heavy Trucks:	61.4	60.0	50.9	52.2	60.5	60.7
Vehicle Noise:	68.1	66.4	63.1	58.5	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	22	47	101	217
CNEL:	23	50	108	232

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Bedford Marketplace
Road Name: Masters Dr. | Job Number: 12751
Road Segment: n/o Bennet Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	600 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.66	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-20.90	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.85	2.52	-1.20	-5.67	0.000	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:	58.1	56.6	50.3	48.7	57.2	57.4
Heavy Trucks:	59.5	58.0	49.0	50.3	58.6	58.7
Vehicle Noise:	66.2	64.4	61.1	56.6	65.1	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	35	75	161
CNEL:	17	37	80	172

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Bedford Marketplace
Road Name: Masters Dr. | Job Number: 12751
Road Segment: n/o Eagle Glen Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,466 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	547 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-4.06	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-21.30	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.26	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.7	61.8	60.1	54.0	62.6	63.2
Medium Trucks:	57.7	56.2	49.9	48.3	56.8	57.0
Heavy Trucks:	59.1	57.6	48.6	49.9	58.2	58.3
Vehicle Noise:	65.8	64.0	60.7	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	33	70	151
CNEL:	16	35	75	162

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Bedford Cyn. Rd.
Road Segment: s/o El Cerrito Rd.

Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	780 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.52	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-19.76	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-23.71	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.8	62.9	61.1	55.0	63.7	64.3
Medium Trucks:	58.8	57.3	50.9	49.4	57.8	58.0
Heavy Trucks:	60.1	58.7	49.6	50.9	59.2	59.4
Vehicle Noise:	66.8	65.0	61.8	57.2	65.8	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	92	198
CNEL:	21	46	98	212

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Bedford Cyn. Rd.
Road Segment: n/o Georgetown Dr.

Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,926 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	893 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.93	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-19.17	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-23.13	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.3	63.4	61.7	55.6	64.2	64.9
Medium Trucks:	59.4	57.8	51.5	49.9	58.4	58.6
Heavy Trucks:	60.7	59.2	50.2	51.5	59.8	59.9
Vehicle Noise:	67.4	65.6	62.3	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	22	47	101	217
CNEL:	23	50	108	232

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Bedford Cyn. Rd.
Road Segment: n/o Eagle Glen Pkwy.

Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,088 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	809 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.36	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-19.60	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-23.56	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.9	63.0	61.2	55.2	63.8	64.4
Medium Trucks:	58.9	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	60.2	58.8	49.8	51.0	59.4	59.5
Vehicle Noise:	66.9	65.2	61.9	57.4	65.9	66.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	44	94	203
CNEL:	22	47	101	217

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Temescal Cyn. Rd.
Road Segment: n/o Cajalco Rd.

Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,599 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,560 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.02	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-17.26	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.21	0.36	-1.20	-5.40	0.000	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:	61.4	59.8	53.5	51.9	60.4	60.6
Heavy Trucks:	62.2	60.8	51.7	53.0	61.3	61.5
Vehicle Noise:	69.4	67.7	64.5	59.9	68.4	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	89	192	414
CNEL:	44	96	206	444

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Temescal Cyn. Rd.
Road Segment: s/o Cajalco Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,684 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,168 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.41	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-15.83	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.78	0.36	-1.20	-5.40	0.000	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	59.3	67.9	68.5
Medium Trucks:	62.8	61.3	54.9	53.4	61.8	62.1
Heavy Trucks:	63.6	62.2	53.2	54.4	62.8	62.9
Vehicle Noise:	70.9	69.1	66.0	61.3	69.8	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	111	239	516
CNEL:	55	119	257	553

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: California Av.
Road Segment: w/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,244 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	524 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-4.24	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-21.48	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.44	2.52	-1.20	-5.67	0.000	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	63.1
Medium Trucks:	57.6	56.1	49.7	48.1	56.6	56.8
Heavy Trucks:	58.9	57.5	48.4	49.7	58.0	58.2
Vehicle Noise:	65.6	63.8	60.6	56.0	64.5	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	32	68	147
CNEL:	16	34	73	158

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: California Av.
Road Segment: e/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	700 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.99	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-20.23	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.18	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.8	62.9	61.1	55.1	63.7	64.3
Medium Trucks:	58.8	57.3	50.9	49.4	57.9	58.1
Heavy Trucks:	60.1	58.7	49.7	50.9	59.3	59.4
Vehicle Noise:	66.8	65.1	61.8	57.3	65.8	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	38	83	179
CNEL:	19	41	89	191

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: El Cerrito Rd.
Road Segment: w/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,043 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,404 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.37	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.87	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.82	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.0	67.1	65.3	59.2	67.9	68.5
Medium Trucks:	63.0	61.5	55.1	53.5	62.0	62.2
Heavy Trucks:	64.3	62.9	53.8	55.1	63.4	63.6
Vehicle Noise:	71.0	69.2	66.0	61.4	70.0	70.4

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

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: El Cerrito Rd.
Road Segment: e/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	25,534 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	2,553 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	36 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	44.0 feet		
Centerline Dist. to Observer:	44.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.63	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.61	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.56	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.2	67.3	65.6	59.5	68.1	68.7
Medium Trucks:	63.2	61.7	55.4	53.8	62.3	62.5
Heavy Trucks:	64.5	63.1	54.1	55.3	63.7	63.8
Vehicle Noise:	71.2	69.5	66.2	61.7	70.2	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	98	211	455
CNEL:	49	105	226	487

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: El Cerrito Rd.
Road Segment: e/o I-15 SB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	16,374 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,637 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	36 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	44.0 feet		
Centerline Dist. to Observer:	44.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.70	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-16.54	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.49	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.3	65.4	63.6	57.6	66.2	66.8
Medium Trucks:	61.3	59.8	53.4	51.9	60.3	60.6
Heavy Trucks:	62.6	61.2	52.2	53.4	61.8	61.9
Vehicle Noise:	69.3	67.6	64.3	59.8	68.3	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	73	157	338
CNEL:	36	78	168	362

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: El Cerrito Rd.
Road Segment: e/o I-15 NB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	9,519 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	952 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	36 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	44.0 feet		
Centerline Dist. to Observer:	44.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.65	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-18.89	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.85	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.9	63.0	61.3	55.2	63.8	64.4
Medium Trucks:	58.9	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	60.3	58.8	49.8	51.0	59.4	59.5
Vehicle Noise:	67.0	65.2	61.9	57.4	65.9	66.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	51	109	236
CNEL:	25	54	117	252

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Eagle Glen Pkwy.
Road Segment: e/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	12,944 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,294 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	36 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	44.0 feet		
Centerline Dist. to Observer:	44.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.32	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-17.56	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.51	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.6	56.5	65.2	65.8
Medium Trucks:	60.3	58.8	52.4	50.9	59.3	59.5
Heavy Trucks:	61.6	60.2	51.1	52.4	60.7	60.9
Vehicle Noise:	68.3	66.6	63.3	58.7	67.3	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	62	134	289
CNEL:	31	67	144	310

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Eagle Glen Pkwy.
Road Segment: e/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	18,480 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,848 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph	**Vehicle Mix**	
Near/Far Lane Distance:	76 feet		
Site Data			
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	65.0 feet		
Centerline Dist. to Observer:	65.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.72	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-16.52	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.48	-0.46	-1.20	-5.30	0.000	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:	61.3	59.8	53.4	51.9	60.3	60.5
Heavy Trucks:	62.1	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	69.3	67.6	64.4	59.8	68.3	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	108	233	501
CNEL:	54	116	250	538

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Cajalco Rd.
Road Segment: e/o I-15 SB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	20,220 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	2,022 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph	**Vehicle Mix**	
Near/Far Lane Distance:	76 feet		
Site Data			
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	65.0 feet		
Centerline Dist. to Observer:	65.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.11	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-16.13	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.09	-0.46	-1.20	-5.30	0.000	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:	61.7	60.2	53.8	52.2	60.7	60.9
Heavy Trucks:	62.5	61.1	52.0	53.3	61.7	61.8
Vehicle Noise:	69.7	68.0	64.8	60.2	68.7	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	115	247	532
CNEL:	57	123	265	571

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Cajalco Rd.
Road Segment: e/o I-15 NB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	30,314 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	3,031 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph	**Vehicle Mix**	
Near/Far Lane Distance:	76 feet		
Site Data			
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	65.0 feet		
Centerline Dist. to Observer:	65.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.87	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-14.37	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.33	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	66.0	59.9	68.5	69.2
Medium Trucks:	63.4	61.9	55.5	54.0	62.5	62.7
Heavy Trucks:	64.3	62.8	53.8	55.1	63.4	63.5
Vehicle Noise:	71.5	69.7	66.6	61.9	70.5	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	70	150	324	698
CNEL:	75	161	347	748

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Cajalco Rd.
Road Segment: e/o Grand Oaks
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	18,024 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,802 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph	**Vehicle Mix**	
Near/Far Lane Distance:	76 feet		
Site Data			
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	65.0 feet		
Centerline Dist. to Observer:	65.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.61	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-16.63	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.59	-0.46	-1.20	-5.30	0.000	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:	61.2	59.7	53.3	51.7	60.2	60.4
Heavy Trucks:	62.0	60.6	51.5	52.8	61.2	61.3
Vehicle Noise:	69.2	67.5	64.3	59.7	68.2	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	49	106	229	493
CNEL:	53	114	246	529

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Cajalco Rd.
Road Segment: e/o Temescal Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	20,076 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	2,008 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph		
Near/Far Lane Distance:	76 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	65.0 feet		
Centerline Dist. to Observer:	65.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.08	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-16.16	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.12	-0.46	-1.20	-5.30	0.000	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:	61.6	60.1	53.8	52.2	60.7	60.9
Heavy Trucks:	62.5	61.1	52.0	53.3	61.6	61.7
Vehicle Noise:	69.7	68.0	64.8	60.1	68.7	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	246	530
CNEL:	57	122	264	568

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Masters Dr.
Road Segment: n/o California Av.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	4,682 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	468 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	14 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	34.0 feet		
Centerline Dist. to Observer:	34.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-4.74	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-21.97	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.93	2.52	-1.20	-5.67	0.000	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:	57.1	55.6	49.2	47.7	56.1	56.3
Heavy Trucks:	58.4	57.0	47.9	49.2	57.5	57.7
Vehicle Noise:	65.1	63.3	60.1	55.5	64.1	64.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	29	63	137
CNEL:	15	31	68	146

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Masters Dr.
Road Segment: s/o California Av.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	9,364 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	936 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	14 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	34.0 feet		
Centerline Dist. to Observer:	34.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.72	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-18.96	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-22.92	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.2	62.4	56.3	65.0	65.6
Medium Trucks:	60.1	58.6	52.2	50.7	59.1	59.4
Heavy Trucks:	61.4	60.0	50.9	52.2	60.5	60.7
Vehicle Noise:	68.1	66.4	63.1	58.5	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	22	47	101	217
CNEL:	23	50	108	232

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Masters Dr.
Road Segment: n/o Bennet Av.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	7,084 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	708 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	14 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	34.0 feet		
Centerline Dist. to Observer:	34.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.94	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-20.18	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.13	2.52	-1.20	-5.67	0.000	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	55.1	63.8	64.4
Medium Trucks:	58.9	57.4	51.0	49.5	57.9	58.1
Heavy Trucks:	60.2	58.8	49.7	51.0	59.3	59.5
Vehicle Noise:	66.9	65.1	61.9	57.3	65.9	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	84	180
CNEL:	19	42	89	193

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Masters Dr.
Road Segment: n/o Eagle Glen Pkwy.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,648 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	665 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.21	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-20.45	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.41	2.52	-1.20	-5.67	0.000	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:	58.6	57.1	50.7	49.2	57.6	57.9
Heavy Trucks:	59.9	58.5	49.5	50.7	59.1	59.2
Vehicle Noise:	66.6	64.9	61.6	57.0	65.6	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	17	37	80	172
CNEL:	18	40	86	185

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Bedford Cyn. Rd.
Road Segment: s/o El Cerrito Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,490 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	949 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.67	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-18.91	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.86	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	63.7	61.9	55.9	64.5	65.1
Medium Trucks:	59.6	58.1	51.7	50.2	58.7	58.9
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	67.6	65.9	62.6	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	105	226
CNEL:	24	52	112	242

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Bedford Cyn. Rd.
Road Segment: n/o Georgetown Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,926 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	893 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.93	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-19.17	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-23.13	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.3	63.4	61.7	55.6	64.2	64.9
Medium Trucks:	59.4	57.8	51.5	49.9	58.4	58.6
Heavy Trucks:	60.7	59.2	50.2	51.5	59.8	59.9
Vehicle Noise:	67.4	65.6	62.3	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	22	47	101	217
CNEL:	23	50	108	232

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Bedford Cyn. Rd.
Road Segment: n/o Eagle Glen Pkwy.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,876 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	988 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.49	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-18.73	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.69	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.8	63.9	62.1	56.1	64.7	65.3
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.1
Heavy Trucks:	61.1	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	67.8	66.1	62.8	58.2	66.8	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	50	108	232
CNEL:	25	53	115	248

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Temescal Cyn. Rd.
Road Segment: n/o Cajalco Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,883 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,588 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.06	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-17.18	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.14	0.36	-1.20	-5.40	0.000	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	57.9	66.6	67.2
Medium Trucks:	61.4	59.9	53.6	52.0	60.5	60.7
Heavy Trucks:	62.3	60.9	51.8	53.1	61.4	61.6
Vehicle Noise:	69.5	67.8	64.6	59.9	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	90	195	419
CNEL:	45	97	209	450

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Temescal Cyn. Rd.
Road Segment: s/o Cajalco Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,242 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,224 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.52	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-15.72	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.67	0.36	-1.20	-5.40	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	67.2	65.5	59.4	68.0	68.6
Medium Trucks:	62.9	61.4	55.0	53.5	61.9	62.2
Heavy Trucks:	63.7	62.3	53.3	54.5	62.9	63.0
Vehicle Noise:	71.0	69.2	66.1	61.4	69.9	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	113	244	525
CNEL:	56	121	261	563

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: California Av.
Road Segment: w/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,480 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	548 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-4.05	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-21.29	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.25	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.7	61.8	60.1	54.0	62.6	63.2
Medium Trucks:	57.8	56.2	49.9	48.3	56.8	57.0
Heavy Trucks:	59.1	57.7	48.6	49.9	58.2	58.3
Vehicle Noise:	65.8	64.0	60.7	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	33	70	152
CNEL:	16	35	75	162

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: California Av.
Road Segment: e/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,320 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	732 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.79	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-20.03	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.99	2.52	-1.20	-5.67	0.000	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	66.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	40	85	184
CNEL:	20	42	91	197

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: El Cerrito Rd.
Road Segment: w/o Bedford Cyn. Rd.

Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,127 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,513 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.56	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.68	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.63	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	67.3	65.5	59.4	68.1	68.7
Medium Trucks:	63.2	61.6	55.3	53.7	62.2	62.4
Heavy Trucks:	64.5	63.0	54.0	55.3	63.6	63.7
Vehicle Noise:	71.2	69.4	66.2	61.6	70.1	70.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	97	209	450
CNEL:	48	104	224	482

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: El Cerrito Rd.
Road Segment: e/o Bedford Cyn. Rd.

Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,140 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,614 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.73	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.50	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.46	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.3	67.4	65.7	59.6	68.2	68.8
Medium Trucks:	63.3	61.8	55.5	53.9	62.4	62.6
Heavy Trucks:	64.6	63.2	54.2	55.4	63.8	63.9
Vehicle Noise:	71.3	69.6	66.3	61.8	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	46	100	214	462
CNEL:	49	107	230	495

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: El Cerrito Rd.
Road Segment: e/o I-15 SB Ramps

Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,980 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,698 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.86	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-16.38	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.33	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.4	65.5	63.8	57.7	66.3	67.0
Medium Trucks:	61.4	59.9	53.6	52.0	60.5	60.7
Heavy Trucks:	62.8	61.3	52.3	53.6	61.9	62.0
Vehicle Noise:	69.5	67.7	64.5	59.9	68.4	68.9

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

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: El Cerrito Rd.
Road Segment: e/o I-15 NB Ramps

Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,125 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,013 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.39	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-18.62	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.58	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.2	63.3	61.5	55.5	64.1	64.7
Medium Trucks:	59.2	57.7	51.3	49.8	58.2	58.5
Heavy Trucks:	60.5	59.1	50.1	51.3	59.7	59.8
Vehicle Noise:	67.2	65.5	62.2	57.7	66.2	66.6

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

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Eagle Glen Pkwy.
Road Segment: e/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,794 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,979 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.53	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-15.71	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.67	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.1	66.2	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	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	38	83	178	384
CNEL:	41	89	191	411

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Eagle Glen Pkwy.
Road Segment: e/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,686 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,369 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.32	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-13.91	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.87	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.1	68.2	66.4	60.4	69.0	69.6
Medium Trucks:	63.9	62.4	56.0	54.5	62.9	63.2
Heavy Trucks:	64.7	63.3	54.3	55.5	63.9	64.0
Vehicle Noise:	71.9	70.2	67.1	62.4	70.9	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	75	161	347	748
CNEL:	80	173	373	803

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o I-15 SB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,005 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,901 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.67	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-14.56	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.52	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.7	68.4	69.0
Medium Trucks:	63.2	61.7	55.4	53.8	62.3	62.5
Heavy Trucks:	64.1	62.6	53.6	54.9	63.2	63.3
Vehicle Noise:	71.3	69.6	66.4	61.7	70.3	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	68	146	314	677
CNEL:	73	157	337	726

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o I-15 NB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,680 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,268 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.19	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-14.05	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.00	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.0	68.1	66.3	60.3	68.9	69.5
Medium Trucks:	63.7	62.2	55.9	54.3	62.8	63.0
Heavy Trucks:	64.6	63.2	54.1	55.4	63.7	63.9
Vehicle Noise:	71.8	70.1	66.9	62.2	70.8	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	158	340	733
CNEL:	79	169	365	787

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o Grand Oaks
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,980 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,998 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.05	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-16.18	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.14	-0.46	-1.20	-5.30	0.000	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	67.3
Medium Trucks:	61.6	60.1	53.7	52.2	60.7	60.9
Heavy Trucks:	62.5	61.0	52.0	53.2	61.6	61.7
Vehicle Noise:	69.7	67.9	64.8	60.1	68.6	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	245	528
CNEL:	57	122	263	567

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o Temescal Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,190 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,119 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.31	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-15.93	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.88	-0.46	-1.20	-5.30	0.000	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:	61.9	60.4	54.0	52.4	60.9	61.1
Heavy Trucks:	62.7	61.3	52.3	53.5	61.9	62.0
Vehicle Noise:	69.9	68.2	65.0	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	255	549
CNEL:	59	127	274	589

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Masters Dr.
Road Segment: n/o California Av.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,049 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	505 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-4.41	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-21.65	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.60	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.4	61.5	59.7	53.7	62.3	62.9
Medium Trucks:	57.4	55.9	49.5	48.0	56.4	56.7
Heavy Trucks:	58.7	57.3	48.3	49.5	57.9	58.0
Vehicle Noise:	65.4	63.7	60.4	55.8	64.4	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	31	67	144
CNEL:	15	33	71	154

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Masters Dr.
Road Segment: s/o California Av.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,071 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,007 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.41	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-18.65	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-22.60	2.52	-1.20	-5.67	0.000	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	58.8	67.4	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	106	228
CNEL:	24	52	113	244

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Masters Dr.
Road Segment: n/o Bennet Av.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,578 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	758 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.64	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-19.88	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.84	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.1	63.2	61.5	55.4	64.0	64.7
Medium Trucks:	59.2	57.7	51.3	49.7	58.2	58.4
Heavy Trucks:	60.5	59.1	50.0	51.3	59.6	59.8
Vehicle Noise:	67.2	65.4	62.2	57.6	66.1	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	87	188
CNEL:	20	43	94	202

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Masters Dr.
Road Segment: n/o Eagle Glen Pkwy.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,098 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	710 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.93	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-20.17	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.12	2.52	-1.20	-5.67	0.000	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	55.1	63.8	64.4
Medium Trucks:	58.9	57.4	51.0	49.5	57.9	58.2
Heavy Trucks:	60.2	58.8	49.7	51.0	59.3	59.5
Vehicle Noise:	66.9	65.2	61.9	57.3	65.9	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	84	180
CNEL:	19	42	90	193

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Bedford Cyn. Rd.
Road Segment: s/o El Cerrito Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,133 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,013 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.38	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-18.62	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.58	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.9	64.0	62.2	56.2	64.8	65.4
Medium Trucks:	59.9	58.4	52.0	50.5	58.9	59.2
Heavy Trucks:	61.2	59.8	50.8	52.0	60.4	60.5
Vehicle Noise:	67.9	66.2	62.9	58.4	66.9	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	51	109	236
CNEL:	25	54	117	253

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Bedford Cyn. Rd.
Road Segment: n/o Georgetown Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,522 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	952 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.65	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-18.89	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.85	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	63.7	62.0	55.9	64.5	65.1
Medium Trucks:	59.6	58.1	51.8	50.2	58.7	58.9
Heavy Trucks:	61.0	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	67.6	65.9	62.6	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	105	226
CNEL:	24	52	112	242

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 | Project Name: Bedford Marketplace
Road Name: Bedford Cyn. Rd. | Job Number: 12751
Road Segment: n/o Eagle Glen Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,542 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,054 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.21	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-18.45	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.40	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.2	62.4	56.3	65.0	65.6
Medium Trucks:	60.1	58.6	52.2	50.7	59.1	59.4
Heavy Trucks:	61.4	60.0	50.9	52.2	60.5	60.7
Vehicle Noise:	68.1	66.4	63.1	58.5	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	52	112	242
CNEL:	26	56	120	259

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 | Project Name: Bedford Marketplace
Road Name: Temescal Cyn. Rd. | Job Number: 12751
Road Segment: n/o Cajalco Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,168 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,717 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.40	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-16.84	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.80	0.36	-1.20	-5.40	0.000	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	64.3	58.3	66.9	67.5
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.0
Heavy Trucks:	62.6	61.2	52.2	53.4	61.8	61.9
Vehicle Noise:	69.8	68.1	64.9	60.3	68.8	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	205	441
CNEL:	47	102	220	474

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 | Project Name: Bedford Marketplace
Road Name: Temescal Cyn. Rd. | Job Number: 12751
Road Segment: s/o Cajalco Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,029 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,403 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.86	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-15.38	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.34	0.36	-1.20	-5.40	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.7	68.4	69.0
Medium Trucks:	63.2	61.7	55.4	53.8	62.3	62.5
Heavy Trucks:	64.1	62.7	53.6	54.9	63.2	63.3
Vehicle Noise:	71.3	69.6	66.4	61.7	70.3	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	119	256	552
CNEL:	59	128	275	592

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 | Project Name: Bedford Marketplace
Road Name: California Av. | Job Number: 12751
Road Segment: w/o Masters Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,912 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	591 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.72	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-20.96	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.92	2.52	-1.20	-5.67	0.000	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	60.4	54.3	63.0	63.6
Medium Trucks:	58.1	56.6	50.2	48.7	57.1	57.4
Heavy Trucks:	59.4	58.0	48.9	50.2	58.5	58.7
Vehicle Noise:	66.1	64.4	61.1	56.5	65.1	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	34	74	160
CNEL:	17	37	79	171

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: California Av.
Road Segment: e/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,897 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	790 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.46	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-19.70	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.66	2.52	-1.20	-5.67	0.000	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	64.8
Medium Trucks:	59.3	57.8	51.5	49.9	58.4	58.6
Heavy Trucks:	60.7	59.2	50.2	51.5	59.8	59.9
Vehicle Noise:	67.3	65.6	62.3	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	42	90	193
CNEL:	21	45	96	207

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: El Cerrito Rd.
Road Segment: w/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,108 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,711 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.89	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.35	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.30	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.8	68.4	69.0
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.8
Heavy Trucks:	64.8	63.4	54.3	55.6	63.9	64.1
Vehicle Noise:	71.5	69.8	66.5	61.9	70.5	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	102	220	473
CNEL:	51	109	235	507

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: El Cerrito Rd.
Road Segment: e/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,244 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,824 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.07	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.17	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.12	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	67.8	66.0	59.9	68.6	69.2
Medium Trucks:	63.7	62.2	55.8	54.2	62.7	62.9
Heavy Trucks:	65.0	63.6	54.5	55.8	64.1	64.3
Vehicle Noise:	71.7	69.9	66.7	62.1	70.7	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	49	105	226	487
CNEL:	52	112	242	521

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: El Cerrito Rd.
Road Segment: e/o I-15 SB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,329 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,833 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.19	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-16.05	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.00	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	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	52.6	53.9	62.2	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:	36	79	169	365
CNEL:	39	84	181	390

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: El Cerrito Rd.
Road Segment: e/o I-15 NB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,909 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,091 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.06	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-18.30	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.26	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.5	63.6	61.9	55.8	64.4	65.0
Medium Trucks:	59.5	58.0	51.7	50.1	58.6	58.8
Heavy Trucks:	60.8	59.4	50.4	51.6	60.0	60.1
Vehicle Noise:	67.5	65.8	62.5	58.0	66.5	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	56	120	258
CNEL:	28	60	128	276

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Eagle Glen Pkwy.
Road Segment: e/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,861 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,086 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.75	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-15.48	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.44	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.3	66.4	64.7	58.6	67.2	67.8
Medium Trucks:	62.3	60.8	54.5	52.9	61.4	61.6
Heavy Trucks:	63.7	62.2	53.2	54.5	62.8	62.9
Vehicle Noise:	70.4	68.6	65.3	60.8	69.3	69.8

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

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Eagle Glen Pkwy.
Road Segment: e/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,209 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,521 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.52	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-13.72	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.68	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.3	68.4	66.6	60.6	69.2	69.8
Medium Trucks:	64.1	62.6	56.2	54.7	63.1	63.3
Heavy Trucks:	64.9	63.5	54.5	55.7	64.1	64.2
Vehicle Noise:	72.1	70.4	67.2	62.6	71.1	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	77	166	358	771
CNEL:	83	178	384	827

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Cajalco Rd.
Road Segment: e/o I-15 SB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,671 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,067 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.92	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-14.32	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.28	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	67.8	66.0	60.0	68.6	69.2
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.7
Heavy Trucks:	64.3	62.9	53.9	55.1	63.5	63.6
Vehicle Noise:	71.5	69.8	66.6	62.0	70.5	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	70	151	326	703
CNEL:	75	162	350	754

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Cajalco Rd.
Road Segment: e/o I-15 NB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,178 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,518 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.51	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-13.73	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.68	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.3	68.4	66.6	60.6	69.2	69.8
Medium Trucks:	64.1	62.6	56.2	54.6	63.1	63.3
Heavy Trucks:	64.9	63.5	54.5	55.7	64.1	64.2
Vehicle Noise:	72.1	70.4	67.2	62.6	71.1	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	77	166	358	770
CNEL:	83	178	383	826

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Cajalco Rd.
Road Segment: e/o Grand Oaks
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,465 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,147 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.37	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-15.87	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.83	-0.46	-1.20	-5.30	0.000	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:	61.9	60.4	54.0	52.5	61.0	61.2
Heavy Trucks:	62.8	61.3	52.3	53.6	61.9	62.0
Vehicle Noise:	70.0	68.2	65.1	60.4	69.0	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	119	257	554
CNEL:	59	128	276	594

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021
Road Name: Cajalco Rd.
Road Segment: e/o Temescal Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,844 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,284 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.64	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-15.60	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.56	-0.46	-1.20	-5.30	0.000	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	64.8	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:	70.3	68.5	65.4	60.7	69.2	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	124	268	578
CNEL:	62	133	288	620

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Masters Dr.
Road Segment: n/o California Av.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,069 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	507 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-4.39	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-21.63	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.58	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.4	61.5	59.7	53.7	62.3	62.9
Medium Trucks:	57.4	55.9	49.5	48.0	56.5	56.7
Heavy Trucks:	58.7	57.3	48.3	49.5	57.9	58.0
Vehicle Noise:	65.4	63.7	60.4	55.9	64.4	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	31	67	144
CNEL:	15	33	72	154

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Masters Dr.
Road Segment: s/o California Av.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,153 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,015 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.37	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-18.61	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-22.57	2.52	-1.20	-5.67	0.000	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	62.8	56.7	65.3	65.9
Medium Trucks:	60.4	58.9	52.6	51.0	59.5	59.7
Heavy Trucks:	61.8	60.3	51.3	52.5	60.9	61.0
Vehicle Noise:	68.4	66.7	63.4	58.9	67.4	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	106	229
CNEL:	24	53	114	245

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Masters Dr.
Road Segment: n/o Bennet Av.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,784 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	778 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.53	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-19.77	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.72	2.52	-1.20	-5.67	0.000	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:	59.3	57.8	51.4	49.9	58.3	58.6
Heavy Trucks:	60.6	59.2	50.1	51.4	59.7	59.9
Vehicle Noise:	67.3	65.6	62.3	57.7	66.3	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	89	192
CNEL:	21	44	95	205

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Masters Dr.
Road Segment: n/o Eagle Glen Pkwy.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,346 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	735 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.78	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-20.02	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.97	2.52	-1.20	-5.67	0.000	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	51.2	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:	18	40	86	184
CNEL:	20	43	92	197

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Bedford Cyn. Rd.
Road Segment: s/o El Cerrito Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,401 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,040 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.27	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-18.51	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.46	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.0	64.1	62.3	56.3	64.9	65.5
Medium Trucks:	60.0	58.5	52.1	50.6	59.1	59.3
Heavy Trucks:	61.3	59.9	50.9	52.1	60.5	60.6
Vehicle Noise:	68.0	66.3	63.0	58.5	67.0	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	52	111	240
CNEL:	26	55	119	257

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Bedford Cyn. Rd.
Road Segment: n/o Georgetown Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,790 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	979 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.53	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-18.77	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.73	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.7	63.8	62.1	56.0	64.6	65.3
Medium Trucks:	59.8	58.2	51.9	50.3	58.8	59.0
Heavy Trucks:	61.1	59.7	50.6	51.9	60.2	60.3
Vehicle Noise:	67.8	66.0	62.8	58.2	66.7	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	50	107	231
CNEL:	25	53	115	247

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Bedford Cyn. Rd.
Road Segment: n/o Eagle Glen Pkwy.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,852 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,085 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.08	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-18.32	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.28	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.3	62.5	56.5	65.1	65.7
Medium Trucks:	60.2	58.7	52.3	50.8	59.2	59.5
Heavy Trucks:	61.5	60.1	51.1	52.3	60.7	60.8
Vehicle Noise:	68.2	66.5	63.2	58.7	67.2	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	115	247
CNEL:	26	57	123	264

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Temescal Cyn. Rd.
Road Segment: n/o Cajalco Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,230 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,723 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.41	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-16.83	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.78	0.36	-1.20	-5.40	0.000	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	64.3	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:	44	95	205	443
CNEL:	47	102	220	475

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Temescal Cyn. Rd.
Road Segment: s/o Cajalco Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,091 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,409 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.87	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-15.37	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.33	0.36	-1.20	-5.40	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.7	68.4	69.0
Medium Trucks:	63.2	61.7	55.4	53.8	62.3	62.5
Heavy Trucks:	64.1	62.7	53.6	54.9	63.2	63.4
Vehicle Noise:	71.3	69.6	66.4	61.7	70.3	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	119	257	553
CNEL:	59	128	275	593

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: California Av.
Road Segment: w/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,954 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	595 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.69	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-20.93	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.89	2.52	-1.20	-5.67	0.000	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	60.4	54.4	63.0	63.6
Medium Trucks:	58.1	56.6	50.2	48.7	57.2	57.4
Heavy Trucks:	59.4	58.0	49.0	50.2	58.6	58.7
Vehicle Noise:	66.1	64.4	61.1	56.6	65.1	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	35	74	160
CNEL:	17	37	80	172

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: California Av.
Road Segment: e/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,917 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	792 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.45	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-19.69	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.65	2.52	-1.20	-5.67	0.000	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	64.8
Medium Trucks:	59.4	57.8	51.5	49.9	58.4	58.6
Heavy Trucks:	60.7	59.2	50.2	51.5	59.8	59.9
Vehicle Noise:	67.4	65.6	62.3	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	42	90	194
CNEL:	21	45	96	207

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: El Cerrito Rd.
Road Segment: w/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,294 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,729 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.92	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.32	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.27	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.8	68.4	69.0
Medium Trucks:	63.5	62.0	55.6	54.1	62.6	62.8
Heavy Trucks:	64.8	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	71.5	69.8	66.5	62.0	70.5	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	102	221	476
CNEL:	51	110	236	509

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: El Cerrito Rd.
Road Segment: e/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,326 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,833 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.08	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.16	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.11	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	67.8	66.0	60.0	68.6	69.2
Medium Trucks:	63.7	62.2	55.8	54.3	62.7	62.9
Heavy Trucks:	65.0	63.6	54.5	55.8	64.1	64.3
Vehicle Noise:	71.7	70.0	66.7	62.1	70.7	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	49	105	226	487
CNEL:	52	112	242	522

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: El Cerrito Rd.
Road Segment: e/o I-15 SB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,411 vehicles
Peak Hour Percentage:	10%
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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.21	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-16.03	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.98	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	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:	37	79	170	366
CNEL:	39	84	182	392

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: El Cerrito Rd.
Road Segment: e/o I-15 NB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,991 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,099 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.03	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-18.27	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.22	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	63.7	61.9	55.8	64.5	65.1
Medium Trucks:	59.6	58.1	51.7	50.1	58.6	58.8
Heavy Trucks:	60.9	59.5	50.4	51.7	60.0	60.2
Vehicle Noise:	67.6	65.8	62.6	58.0	66.6	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	56	120	259
CNEL:	28	60	129	278

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Eagle Glen Pkwy.
Road Segment: e/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,109 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,111 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.81	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-15.43	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.39	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	66.5	64.7	58.7	67.3	67.9
Medium Trucks:	62.4	60.9	54.5	53.0	61.4	61.7
Heavy Trucks:	63.7	62.3	53.3	54.5	62.9	63.0
Vehicle Noise:	70.4	68.7	65.4	60.9	69.4	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	40	86	186	401
CNEL:	43	92	199	429

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Eagle Glen Pkwy.
Road Segment: e/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	36,713 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,671 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.70	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-13.54	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.50	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	68.6	66.8	60.8	69.4	70.0
Medium Trucks:	64.2	62.7	56.4	54.8	63.3	63.5
Heavy Trucks:	65.1	63.7	54.6	55.9	64.2	64.4
Vehicle Noise:	72.3	70.6	67.4	62.7	71.3	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	79	171	368	793
CNEL:	85	183	395	850

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o I-15 SB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,546 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,155 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.04	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-14.20	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.16	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.8	67.9	66.2	60.1	68.7	69.3
Medium Trucks:	63.6	62.1	55.7	54.2	62.6	62.9
Heavy Trucks:	64.4	63.0	54.0	55.2	63.6	63.7
Vehicle Noise:	71.7	69.9	66.8	62.1	70.6	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	154	332	716
CNEL:	77	166	357	768

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o I-15 NB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,426 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,543 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.54	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-13.70	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.65	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.3	68.4	66.7	60.6	69.2	69.8
Medium Trucks:	64.1	62.6	56.2	54.7	63.1	63.4
Heavy Trucks:	64.9	63.5	54.5	55.7	64.1	64.2
Vehicle Noise:	72.2	70.4	67.3	62.6	71.1	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	77	167	359	774
CNEL:	83	179	385	830

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o Grand Oaks
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,713 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,171 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.42	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-15.82	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.78	-0.46	-1.20	-5.30	0.000	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	58.5	67.1	67.7
Medium Trucks:	62.0	60.5	54.1	52.6	61.0	61.2
Heavy Trucks:	62.8	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	70.0	68.3	65.1	60.5	69.0	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	120	259	558
CNEL:	60	129	278	599

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Interim Year 2021 Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o Temescal Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,968 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,297 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.66	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-15.58	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.53	-0.46	-1.20	-5.30	0.000	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	64.8	58.7	67.3	67.9
Medium Trucks:	62.2	60.7	54.3	52.8	61.3	61.5
Heavy Trucks:	63.1	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	70.3	68.5	65.4	60.7	69.3	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	125	269	580
CNEL:	62	134	289	622

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: Masters Dr. | Job Number: 12751
Road Segment: n/o California Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	800 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.41	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-19.65	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.60	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.4	63.5	61.7	55.7	64.3	64.9
Medium Trucks:	59.4	57.9	51.5	50.0	58.4	58.7
Heavy Trucks:	60.7	59.3	50.3	51.5	59.9	60.0
Vehicle Noise:	67.4	65.7	62.4	57.8	66.4	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	42	91	195
CNEL:	21	45	97	209

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: Masters Dr. | Job Number: 12751
Road Segment: s/o California Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	880 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.99	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-19.23	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.19	2.52	-1.20	-5.67	0.000	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	62.1	56.1	64.7	65.3
Medium Trucks:	59.8	58.3	51.9	50.4	58.9	59.1
Heavy Trucks:	61.1	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	67.8	66.1	62.8	58.3	66.8	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	45	97	208
CNEL:	22	48	103	223

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: Masters Dr. | Job Number: 12751
Road Segment: n/o Bennet Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	640 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.38	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-20.62	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.57	2.52	-1.20	-5.67	0.000	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	50.6	49.0	57.5	57.7
Heavy Trucks:	59.7	58.3	49.3	50.5	58.9	59.0
Vehicle Noise:	66.4	64.7	61.4	56.9	65.4	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	17	36	78	168
CNEL:	18	39	84	180

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: Masters Dr. | Job Number: 12751
Road Segment: n/o Eagle Glen Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	610 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.59	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-20.82	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.78	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	62.3	60.5	54.5	63.1	63.7
Medium Trucks:	58.2	56.7	50.4	48.8	57.3	57.5
Heavy Trucks:	59.5	58.1	49.1	50.3	58.7	58.8
Vehicle Noise:	66.2	64.5	61.2	56.7	65.2	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	35	76	163
CNEL:	17	38	81	174

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035
Road Name: Bedford Cyn. Rd.
Road Segment: s/o El Cerrito Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,450 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.17	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-17.06	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.02	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.5	65.6	63.8	57.7	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	67.7	64.5	59.9	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	65	139	300
CNEL:	32	69	149	321

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035
Road Name: Bedford Cyn. Rd.
Road Segment: n/o Georgetown Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,450 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.17	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-17.06	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.02	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.5	65.6	63.8	57.7	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	67.7	64.5	59.9	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	65	139	300
CNEL:	32	69	149	321

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035
Road Name: Bedford Cyn. Rd.
Road Segment: n/o Eagle Glen Pkwy.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,420 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	38.0 feet
Centerline Dist. to Observer:	38.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	36.401
Medium Trucks:	36.157
Heavy Trucks:	36.181

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.08	1.96	-1.20	-4.57	0.000	0.000
Medium Trucks:	77.72	-17.15	2.01	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.11	2.00	-1.20	-5.59	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.4	65.5	63.7	57.6	66.3	66.9
Medium Trucks:	61.4	59.9	53.5	52.0	60.4	60.6
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:	30	64	137	295
CNEL:	32	68	147	316

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035
Road Name: Temescal Cyn. Rd.
Road Segment: n/o Cajalco Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,650 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.28	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-14.96	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.91	0.36	-1.20	-5.40	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.9	68.0	66.2	60.2	68.8	69.4
Medium Trucks:	63.7	62.1	55.8	54.2	62.7	62.9
Heavy Trucks:	64.5	63.1	54.0	55.3	63.6	63.8
Vehicle Noise:	71.7	70.0	66.8	62.2	70.7	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	127	274	590
CNEL:	63	136	294	632

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: Temescal Cyn. Rd. | Job Number: 12751
Road Segment: s/o Cajalco Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,100 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.27	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-15.97	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.92	0.36	-1.20	-5.40	0.000	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	65.2	59.1	67.8	68.4
Medium Trucks:	62.6	61.1	54.8	53.2	61.7	61.9
Heavy Trucks:	63.5	62.1	53.0	54.3	62.6	62.8
Vehicle Noise:	70.7	69.0	65.8	61.1	69.7	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	109	234	505
CNEL:	54	117	251	542

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: California Av. | Job Number: 12751
Road Segment: w/o Masters Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	830 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.25	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-19.49	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.44	2.52	-1.20	-5.67	0.000	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:	59.6	58.0	51.7	50.1	58.6	58.8
Heavy Trucks:	60.9	59.5	50.4	51.7	60.0	60.1
Vehicle Noise:	67.6	65.8	62.5	58.0	66.5	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	93	200
CNEL:	21	46	99	214

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: California Av. | Job Number: 12751
Road Segment: e/o Masters Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,080 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.11	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-18.34	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-22.30	2.52	-1.20	-5.67	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.7	64.8	63.0	57.0	65.6	66.2
Medium Trucks:	60.7	59.2	52.8	51.3	59.7	60.0
Heavy Trucks:	62.0	60.6	51.6	52.8	61.2	61.3
Vehicle Noise:	68.7	67.0	63.7	59.2	67.7	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	51	111	238
CNEL:	26	55	118	255

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: El Cerrito Rd. | Job Number: 12751
Road Segment: w/o Bedford Cyn. Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,900 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.18	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.05	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.01	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.8	67.9	66.1	60.1	68.7	69.3
Medium Trucks:	63.8	62.3	55.9	54.4	62.8	63.1
Heavy Trucks:	65.1	63.7	54.6	55.9	64.2	64.4
Vehicle Noise:	71.8	70.1	66.8	62.2	70.8	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	107	230	495
CNEL:	53	114	246	530

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: El Cerrito Rd. | Job Number: 12751
Road Segment: e/o Bedford Cyn. Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,510 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	4.01	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-13.22	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-17.18	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.6	68.7	66.9	60.9	69.5	70.1
Medium Trucks:	64.6	63.1	56.7	55.2	63.6	63.9
Heavy Trucks:	65.9	64.5	55.5	56.7	65.1	65.2
Vehicle Noise:	72.6	70.9	67.6	63.1	71.6	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	261	562
CNEL:	60	130	279	602

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: El Cerrito Rd. | Job Number: 12751
Road Segment: e/o I-15 SB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,710 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.89	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.35	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.30	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.8	68.4	69.0
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.8
Heavy Trucks:	64.8	63.4	54.3	55.6	63.9	64.1
Vehicle Noise:	71.5	69.8	66.5	61.9	70.5	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	102	220	473
CNEL:	51	109	235	507

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: El Cerrito Rd. | Job Number: 12751
Road Segment: e/o I-15 NB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,720 vehicles
Vehicle Speed:	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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.92	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-16.32	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.28	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.5	65.6	63.8	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	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	75	162	350
CNEL:	37	81	174	374

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: Eagle Glen Pkwy. | Job Number: 12751
Road Segment: e/o Masters Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,730 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.94	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-16.30	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.25	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.5	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:	62.8	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:	35	76	163	351
CNEL:	38	81	174	376

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035
Road Name: Eagle Glen Pkwy.
Road Segment: e/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,060 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.19	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-16.05	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.01	-0.46	-1.20	-5.30	0.000	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	64.3	58.2	66.9	67.5
Medium Trucks:	61.7	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	62.6	61.2	52.1	53.4	61.7	61.9
Vehicle Noise:	69.8	68.1	64.9	60.2	68.8	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	116	250	539
CNEL:	58	125	268	578

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035
Road Name: Cajalco Rd.
Road Segment: e/o I-15 SB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,490 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.01	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-15.23	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.18	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.8	66.9	65.1	59.1	67.7	68.3
Medium Trucks:	62.6	61.1	54.7	53.1	61.6	61.8
Heavy Trucks:	63.4	62.0	53.0	54.2	62.6	62.7
Vehicle Noise:	70.6	68.9	65.7	61.1	69.6	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	132	284	612
CNEL:	66	141	305	656

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035
Road Name: Cajalco Rd.
Road Segment: e/o I-15 NB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,070 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.92	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-14.32	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.27	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	67.8	66.0	60.0	68.6	69.2
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.8
Heavy Trucks:	64.3	62.9	53.9	55.1	63.5	63.6
Vehicle Noise:	71.5	69.8	66.6	62.0	70.5	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	70	152	326	703
CNEL:	75	163	350	755

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035
Road Name: Cajalco Rd.
Road Segment: e/o Grand Oaks
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,900 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.84	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-16.40	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.36	-0.46	-1.20	-5.30	0.000	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	64.0	57.9	66.5	67.1
Medium Trucks:	61.4	59.9	53.5	52.0	60.4	60.7
Heavy Trucks:	62.2	60.8	51.8	53.0	61.4	61.5
Vehicle Noise:	69.5	67.7	64.6	59.9	68.4	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	51	110	237	511
CNEL:	55	118	254	548

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 | Project Name: Bedford Marketplace
Road Name: Cajalco Rd. | Job Number: 12751
Road Segment: e/o Temescal Cyn. Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,000 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.82	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-14.42	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.37	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	63.4	61.9	55.5	54.0	62.4	62.7
Heavy Trucks:	64.2	62.8	53.8	55.0	63.4	63.5
Vehicle Noise:	71.4	69.7	66.5	61.9	70.4	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	149	322	693
CNEL:	74	160	345	743

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project | Project Name: Bedford Marketplace
Road Name: Masters Dr. | Job Number: 12751
Road Segment: n/o California Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,250 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	825 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.27	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-19.51	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.47	2.52	-1.20	-5.67	0.000	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	61.8	55.8	64.4	65.0
Medium Trucks:	59.5	58.0	51.7	50.1	58.6	58.8
Heavy Trucks:	60.8	59.4	50.4	51.6	60.0	60.1
Vehicle Noise:	67.5	65.8	62.5	58.0	66.5	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	92	199
CNEL:	21	46	99	213

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project | Project Name: Bedford Marketplace
Road Name: Masters Dr. | Job Number: 12751
Road Segment: s/o California Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,668 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	967 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.59	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-18.82	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-22.78	2.52	-1.20	-5.67	0.000	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:	60.2	58.7	52.4	50.8	59.3	59.5
Heavy Trucks:	61.5	60.1	51.1	52.3	60.7	60.8
Vehicle Noise:	68.2	66.5	63.2	58.7	67.2	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	22	48	103	221
CNEL:	24	51	110	237

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project | Project Name: Bedford Marketplace
Road Name: Masters Dr. | Job Number: 12751
Road Segment: n/o Bennet Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,690 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	769 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.58	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-19.82	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.77	2.52	-1.20	-5.67	0.000	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:	59.2	57.7	51.4	49.8	58.3	58.5
Heavy Trucks:	60.5	59.1	50.1	51.3	59.7	59.8
Vehicle Noise:	67.2	65.5	62.2	57.7	66.2	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	88	190
CNEL:	20	44	94	203

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Masters Dr.
Road Segment: n/o Eagle Glen Pkwy.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		***Site Conditions (Hard = 10, Soft = 15)***	
Average Daily Traffic (Adt):	7,532 vehicles	*Autos:*	15
Peak Hour Percentage:	10%	*Medium Trucks (2 Axles):*	15
Peak Hour Volume:	753 vehicles	*Heavy Trucks (3+ Axles):*	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	14 feet		

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%

Site Data		***Noise Source Elevations (in feet)***			
Barrier Height:	**0.0 feet**	*Autos:*	0.000		
Barrier Type (0-Wall, 1-Berm):	0.0	*Medium Trucks:*	2.297		
Centerline Dist. to Barrier:	34.0 feet	*Heavy Trucks:*	8.006	*Grade Adjustment:*	0.0
Centerline Dist. to Observer:	34.0 feet				
Barrier Distance to Observer:	0.0 feet	***Lane Equivalent Distance (in feet)***			
Observer Height (Above Pad):	5.0 feet	*Autos:*	33.645		
Pad Elevation:	0.0 feet	*Medium Trucks:*	33.381		
Road Elevation:	0.0 feet	*Heavy Trucks:*	33.407		
Road Grade:	0.0%				
Left View:	-90.0 degrees				
Right View:	90.0 degrees				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.67	2.48	-1.20	*-4.53*	0.000	0.000
Medium Trucks:	77.72	-19.91	2.53	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	82.99	-23.86	2.52	-1.20	*-5.67*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.1	63.2	61.5	55.4	64.0	64.6
Medium Trucks:	59.1	57.6	51.3	49.7	58.2	58.4
Heavy Trucks:	60.5	59.0	50.0	51.2	59.6	59.7
Vehicle Noise:	67.1	65.4	62.1	57.6	66.1	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	40	87	187
CNEL:	20	43	93	201

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Bedford Cyn. Rd.
Road Segment: s/o El Cerrito Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		***Site Conditions (Hard = 10, Soft = 15)***	
Average Daily Traffic (Adt):	16,458 vehicles	*Autos:*	15
Peak Hour Percentage:	10%	*Medium Trucks (2 Axles):*	15
Peak Hour Volume:	1,646 vehicles	*Heavy Trucks (3+ Axles):*	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	24 feet		

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%

Site Data		***Noise Source Elevations (in feet)***			
Barrier Height:	**0.0 feet**	*Autos:*	0.000		
Barrier Type (0-Wall, 1-Berm):	0.0	*Medium Trucks:*	2.297		
Centerline Dist. to Barrier:	38.0 feet	*Heavy Trucks:*	8.006	*Grade Adjustment:*	0.0
Centerline Dist. to Observer:	38.0 feet				
Barrier Distance to Observer:	0.0 feet	***Lane Equivalent Distance (in feet)***			
Observer Height (Above Pad):	5.0 feet	*Autos:*	36.401		
Pad Elevation:	0.0 feet	*Medium Trucks:*	36.157		
Road Elevation:	0.0 feet	*Heavy Trucks:*	36.181		
Road Grade:	0.0%				
Left View:	-90.0 degrees				
Right View:	90.0 degrees				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.72	1.96	-1.20	*-4.57*	0.000	0.000
Medium Trucks:	77.72	-16.51	2.01	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.47	2.00	-1.20	*-5.59*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.1	64.3	58.3	66.9	67.5
Medium Trucks:	62.0	60.5	54.1	52.6	61.1	61.3
Heavy Trucks:	63.3	61.9	52.9	54.1	62.5	62.6
Vehicle Noise:	70.0	68.3	65.0	60.5	69.0	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	70	151	326
CNEL:	35	75	162	349

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Bedford Cyn. Rd.
Road Segment: n/o Georgetown Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		***Site Conditions (Hard = 10, Soft = 15)***	
Average Daily Traffic (Adt):	16,458 vehicles	*Autos:*	15
Peak Hour Percentage:	10%	*Medium Trucks (2 Axles):*	15
Peak Hour Volume:	1,646 vehicles	*Heavy Trucks (3+ Axles):*	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	24 feet		

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%

Site Data		***Noise Source Elevations (in feet)***			
Barrier Height:	**0.0 feet**	*Autos:*	0.000		
Barrier Type (0-Wall, 1-Berm):	0.0	*Medium Trucks:*	2.297		
Centerline Dist. to Barrier:	38.0 feet	*Heavy Trucks:*	8.006	*Grade Adjustment:*	0.0
Centerline Dist. to Observer:	38.0 feet				
Barrier Distance to Observer:	0.0 feet	***Lane Equivalent Distance (in feet)***			
Observer Height (Above Pad):	5.0 feet	*Autos:*	36.401		
Pad Elevation:	0.0 feet	*Medium Trucks:*	36.157		
Road Elevation:	0.0 feet	*Heavy Trucks:*	36.181		
Road Grade:	0.0%				
Left View:	-90.0 degrees				
Right View:	90.0 degrees				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.72	1.96	-1.20	*-4.57*	0.000	0.000
Medium Trucks:	77.72	-16.51	2.01	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.47	2.00	-1.20	*-5.59*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.1	64.3	58.3	66.9	67.5
Medium Trucks:	62.0	60.5	54.1	52.6	61.1	61.3
Heavy Trucks:	63.3	61.9	52.9	54.1	62.5	62.6
Vehicle Noise:	70.0	68.3	65.0	60.5	69.0	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	70	151	326
CNEL:	35	75	162	349

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Bedford Cyn. Rd.
Road Segment: n/o Eagle Glen Pkwy.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		***Site Conditions (Hard = 10, Soft = 15)***	
Average Daily Traffic (Adt):	16,298 vehicles	*Autos:*	15
Peak Hour Percentage:	10%	*Medium Trucks (2 Axles):*	15
Peak Hour Volume:	1,630 vehicles	*Heavy Trucks (3+ Axles):*	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	24 feet		

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%

Site Data		***Noise Source Elevations (in feet)***			
Barrier Height:	**0.0 feet**	*Autos:*	0.000		
Barrier Type (0-Wall, 1-Berm):	0.0	*Medium Trucks:*	2.297		
Centerline Dist. to Barrier:	38.0 feet	*Heavy Trucks:*	8.006	*Grade Adjustment:*	0.0
Centerline Dist. to Observer:	38.0 feet				
Barrier Distance to Observer:	0.0 feet	***Lane Equivalent Distance (in feet)***			
Observer Height (Above Pad):	5.0 feet	*Autos:*	36.401		
Pad Elevation:	0.0 feet	*Medium Trucks:*	36.157		
Road Elevation:	0.0 feet	*Heavy Trucks:*	36.181		
Road Grade:	0.0%				
Left View:	-90.0 degrees				
Right View:	90.0 degrees				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.68	1.96	-1.20	*-4.57*	0.000	0.000
Medium Trucks:	77.72	-16.56	2.01	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-20.51	2.00	-1.20	*-5.59*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.1	64.3	58.2	66.9	67.5
Medium Trucks:	62.0	60.5	54.1	52.6	61.0	61.2
Heavy Trucks:	63.3	61.9	52.8	54.1	62.4	62.6
Vehicle Noise:	70.0	68.3	65.0	60.4	69.0	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	70	150	324
CNEL:	35	75	161	347

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Temescal Cyn. Rd.
Road Segment: n/o Cajalco Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,846 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,685 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.34	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-14.90	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.86	0.36	-1.20	-5.40	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.9	68.0	66.3	60.2	68.8	69.4
Medium Trucks:	63.7	62.2	55.8	54.3	62.8	63.0
Heavy Trucks:	64.6	63.1	54.1	55.3	63.7	63.8
Vehicle Noise:	71.8	70.0	66.9	62.2	70.8	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	128	276	595
CNEL:	64	137	296	638

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Temescal Cyn. Rd.
Road Segment: s/o Cajalco Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,448 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,845 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	51 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	53.0 feet
Centerline Dist. to Observer:	53.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	46.731
Medium Trucks:	46.541
Heavy Trucks:	46.559

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.59	0.34	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-14.65	0.36	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.60	0.36	-1.20	-5.40	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.2	68.3	66.5	60.5	69.1	69.7
Medium Trucks:	64.0	62.5	56.1	54.6	63.0	63.2
Heavy Trucks:	64.8	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	72.0	70.3	67.1	62.5	71.0	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	62	133	287	618
CNEL:	66	143	308	663

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: California Av.
Road Segment: w/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,578 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	858 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.11	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-19.34	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.30	2.52	-1.20	-5.67	0.000	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:	59.7	58.2	51.8	50.3	58.7	59.0
Heavy Trucks:	61.0	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	67.7	66.0	62.7	58.2	66.7	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	44	95	204
CNEL:	22	47	102	219

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: California Av.
Road Segment: e/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,140 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,114 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	34.0 feet
Centerline Dist. to Observer:	34.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	33.645
Medium Trucks:	33.381
Heavy Trucks:	33.407

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.97	2.48	-1.20	-4.53	0.000	0.000
Medium Trucks:	77.72	-18.21	2.53	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-22.16	2.52	-1.20	-5.67	0.000	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:	62.2	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:	24	52	113	243
CNEL:	26	56	121	261

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: El Cerrito Rd.
Road Segment: w/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,270 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,027 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.37	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-13.87	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-17.82	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.0	68.1	66.3	60.2	68.9	69.5
Medium Trucks:	64.0	62.5	56.1	54.5	63.0	63.2
Heavy Trucks:	65.3	63.9	54.8	56.1	64.4	64.6
Vehicle Noise:	72.0	70.2	67.0	62.4	71.0	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	51	110	236	509
CNEL:	55	118	253	545

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: El Cerrito Rd.
Road Segment: e/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,788 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,579 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	4.10	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-13.14	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-17.10	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.7	68.8	67.0	61.0	69.6	70.2
Medium Trucks:	64.7	63.2	56.8	55.3	63.7	64.0
Heavy Trucks:	66.0	64.6	55.5	56.8	65.2	65.3
Vehicle Noise:	72.7	71.0	67.7	63.1	71.7	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	57	123	264	570
CNEL:	61	131	283	610

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: El Cerrito Rd.
Road Segment: e/o I-15 SB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,788 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,779 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.00	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.24	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.20	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	63.6	62.1	55.7	54.2	62.6	62.9
Heavy Trucks:	64.9	63.5	54.4	55.7	64.1	64.2
Vehicle Noise:	71.6	69.9	66.6	62.0	70.6	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	104	223	481
CNEL:	52	111	239	515

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: El Cerrito Rd.
Road Segment: e/o I-15 NB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,888 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,789 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.09	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-16.15	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.11	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.7	65.8	64.0	58.0	66.6	67.2
Medium Trucks:	61.7	60.2	53.8	52.3	60.7	61.0
Heavy Trucks:	63.0	61.6	52.5	53.8	62.1	62.3
Vehicle Noise:	69.7	68.0	64.7	60.1	68.7	69.1

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

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Eagle Glen Pkwy.
Road Segment: e/o Masters Dr.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,398 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,440 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:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.43	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-14.80	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.76	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.0	67.1	65.4	59.3	67.9	68.5
Medium Trucks:	63.0	61.5	55.2	53.6	62.1	62.3
Heavy Trucks:	64.3	62.9	53.9	55.1	63.5	63.6
Vehicle Noise:	71.0	69.3	66.0	61.5	70.0	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	205	441
CNEL:	47	102	219	472

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Eagle Glen Pkwy.
Road Segment: e/o Bedford Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,310 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,731 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.77	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-13.47	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.43	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	68.6	66.9	60.8	69.5	70.1
Medium Trucks:	64.3	62.8	56.5	54.9	63.4	63.6
Heavy Trucks:	65.2	63.7	54.7	56.0	64.3	64.4
Vehicle Noise:	72.4	70.6	67.5	62.8	71.4	71.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	80	173	372	801
CNEL:	86	185	399	859

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o I-15 SB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,560 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,456 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.43	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-13.80	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.76	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.2	68.3	66.6	60.5	69.1	69.7
Medium Trucks:	64.0	62.5	56.1	54.6	63.0	63.3
Heavy Trucks:	64.8	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	72.1	70.3	67.2	62.5	71.0	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	164	353	761
CNEL:	82	176	379	817

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o I-15 NB Ramps
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,314 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,331 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	76 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	65.0 feet
Centerline Dist. to Observer:	65.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.28	-0.48	-1.20	-4.70	0.000	0.000
Medium Trucks:	79.45	-13.96	-0.46	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.92	-0.46	-1.20	-5.30	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.1	68.2	66.4	60.3	69.0	69.6
Medium Trucks:	63.8	62.3	56.0	54.4	62.9	63.1
Heavy Trucks:	64.7	63.3	54.2	55.5	63.8	63.9
Vehicle Noise:	71.9	70.2	67.0	62.3	70.9	71.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	74	160	345	743
CNEL:	80	172	370	797

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o Grand Oaks
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		***Site Conditions (Hard = 10, Soft = 15)***	
Average Daily Traffic (Adt):	21,204 vehicles	*Autos:*	15
Peak Hour Percentage:	10%	*Medium Trucks (2 Axles):*	15
Peak Hour Volume:	2,120 vehicles	*Heavy Trucks (3+ Axles):*	15
Vehicle Speed:	45 mph		
Near/Far Lane Distance:	76 feet		
Site Data			
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	65.0 feet		
Centerline Dist. to Observer:	65.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.31	-0.48	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	79.45	-15.93	-0.46	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.88	-0.46	-1.20	*-5.30*	0.000	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:	61.9	60.4	54.0	52.5	60.9	61.1
Heavy Trucks:	62.7	61.3	52.3	53.5	61.9	62.0
Vehicle Noise:	69.9	68.2	65.0	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	255	550
CNEL:	59	127	274	590

Friday, November 22, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Horizon Year 2035 Plus Project
Road Name: Cajalco Rd.
Road Segment: e/o Temescal Cyn. Rd.
Project Name: Bedford Marketplace
Job Number: 12751

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		***Site Conditions (Hard = 10, Soft = 15)***	
Average Daily Traffic (Adt):	31,238 vehicles	*Autos:*	15
Peak Hour Percentage:	10%	*Medium Trucks (2 Axles):*	15
Peak Hour Volume:	3,124 vehicles	*Heavy Trucks (3+ Axles):*	15
Vehicle Speed:	45 mph		
Near/Far Lane Distance:	76 feet		
Site Data			
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	65.0 feet		
Centerline Dist. to Observer:	65.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

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:	52.972
Medium Trucks:	52.804
Heavy Trucks:	52.821

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.00	-0.48	-1.20	*-4.70*	0.000	0.000
Medium Trucks:	79.45	-14.24	-0.46	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.20	-0.46	-1.20	*-5.30*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.8	67.9	66.1	60.1	68.7	69.3
Medium Trucks:	63.5	62.0	55.7	54.1	62.6	62.8
Heavy Trucks:	64.4	63.0	53.9	55.2	63.5	63.7
Vehicle Noise:	71.6	69.9	66.7	62.0	70.6	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	71	153	330	712
CNEL:	76	164	354	763

Friday, November 22, 2019

APPENDIX 7.2:

OFF-SITE SOIL IMPORT/EXPORT HAUL TRUCK CONSTRUCTION ANALYSIS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Without Project Haul Trips
Road Name: I-15 Freeway
Lot No: 20225 Bedford Canyon Rd.

Project Name: Soil Import/Export
Job Number: 12751
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	164,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	16,400 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	142 feet

Site Data

Barrier Height:	**16.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	93.0 feet
Centerline Dist. to Observer:	162.0 feet
Barrier Distance to Observer:	69.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	928.0 feet
Road Elevation:	922.0 feet
Barrier Elevation:	922.0 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:	75.5%	14.0%	10.5%	94.39%
Medium Trucks:	48.9%	2.2%	48.9%	1.95%
Heavy Trucks:	47.3%	5.4%	47.3%	3.66%

Noise Source Elevations (in feet)

Autos:	922.000		
Medium Trucks:	924.297		
Heavy Trucks:	930.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	131.342
Medium Trucks:	130.791
Heavy Trucks:	129.777

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.54	8.46	-6.39	-1.20	*1.15*	-10.600	-13.600
Medium Trucks:	81.71	-8.39	-6.37	-1.20	*0.93*	-10.090	-13.090
Heavy Trucks:	85.21	-5.65	-6.32	-1.20	*0.49*	-8.450	-11.450

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	76.4	74.4	73.1	67.1	75.5	76.1
Medium Trucks:	65.8	61.9	54.4	63.1	69.3	69.3
Heavy Trucks:	72.0	68.0	64.6	69.2	75.4	75.5
Vehicle Noise:	78.0	75.5	73.7	71.9	79.0	79.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.8	63.8	62.5	56.5	64.9	65.5
Medium Trucks:	55.7	51.8	44.3	53.0	59.2	59.2
Heavy Trucks:	63.6	59.5	56.2	60.8	67.0	67.1
Vehicle Noise:	68.1	65.4	63.4	62.7	69.5	69.8

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Without Project Haul Trips
Road Name: Magnolia Ave.
Lot No: 1295 Magnolia Ave.

Project Name: Soil Import/Export
Job Number: 12751
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,000 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	82.0 feet
Centerline Dist. to Observer:	82.0 feet
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:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	73.348
Medium Trucks:	73.228
Heavy Trucks:	73.240

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	4.07	-2.60	-1.20	*-4.74*	0.000	0.000
Medium Trucks:	77.62	-13.17	-2.59	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.14	-17.12	-2.59	-1.20	*-5.22*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.6	67.6	66.3	60.3	68.7	69.3
Medium Trucks:	60.7	56.8	49.3	58.0	64.2	64.2
Heavy Trucks:	61.2	57.2	53.8	58.4	64.6	64.7
Vehicle Noise:	70.7	68.3	66.6	63.8	71.1	71.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.6	67.6	66.3	60.3	68.7	69.3
Medium Trucks:	60.7	56.8	49.3	58.0	64.2	64.2
Heavy Trucks:	61.2	57.2	53.8	58.4	64.6	64.7
Vehicle Noise:	70.7	68.3	66.6	63.8	71.1	71.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Without Project Haul Trips
Road Name: Sherborn St.
Lot No: 1168 Sherborn St.

Project Name: Soil Import/Export
Job Number: 12751
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	790 vehicles
Vehicle Speed:	35 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:	130.0 feet
Centerline Dist. to Observer:	130.0 feet
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:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	129.958
Medium Trucks:	129.890
Heavy Trucks:	129.896

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-1.88	-6.33	-1.20	*-4.80*	0.000	0.000
Medium Trucks:	74.83	-19.12	-6.32	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	80.05	-23.08	-6.32	-1.20	*-5.10*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.7	53.7	52.4	46.4	54.8	55.4
Medium Trucks:	48.2	44.3	36.8	45.5	51.7	51.7
Heavy Trucks:	49.4	45.4	42.0	46.7	52.9	52.9
Vehicle Noise:	57.2	54.7	52.9	51.0	58.1	58.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.7	53.7	52.4	46.4	54.8	55.4
Medium Trucks:	48.2	44.3	36.8	45.5	51.7	51.7
Heavy Trucks:	49.4	45.4	42.0	46.7	52.9	52.9
Vehicle Noise:	57.2	54.7	52.9	51.0	58.1	58.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: With Project Haul Trips
Road Name: I-15 Freeway
Lot No: 20225 Bedford Canyon Rd.

Project Name: Soil Import/Export
Job Number: 12751
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	164,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	16,450 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	142 feet

Site Data

Barrier Height:	**16.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	93.0 feet
Centerline Dist. to Observer:	162.0 feet
Barrier Distance to Observer:	69.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	928.0 feet
Road Elevation:	922.0 feet
Barrier Elevation:	922.0 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:	75.5%	14.0%	10.5%	94.10%
Medium Trucks:	48.9%	2.2%	48.9%	1.94%
Heavy Trucks:	47.3%	5.4%	47.3%	3.95%

Noise Source Elevations (in feet)

Autos:	922.000		
Medium Trucks:	924.297		
Heavy Trucks:	930.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	131.342
Medium Trucks:	130.791
Heavy Trucks:	129.777

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.54	8.46	-6.39	-1.20	*1.15*	-10.600	-13.600
Medium Trucks:	81.71	-8.39	-6.37	-1.20	*0.93*	-10.090	-13.090
Heavy Trucks:	85.21	-5.31	-6.32	-1.20	*0.49*	-8.450	-11.450

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	76.4	74.4	73.1	67.1	75.5	76.1
Medium Trucks:	65.7	61.9	54.3	63.1	69.3	69.3
Heavy Trucks:	72.4	68.3	64.9	69.6	75.8	75.9
Vehicle Noise:	78.1	75.6	73.8	72.1	79.1	79.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.8	63.8	62.5	56.5	64.9	65.5
Medium Trucks:	55.7	51.8	44.3	53.0	59.2	59.2
Heavy Trucks:	63.9	59.9	56.5	61.1	67.3	67.4
Vehicle Noise:	68.2	65.5	63.5	62.9	69.7	70.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: With Project Haul Trips
Road Name: Magnolia Ave.
Lot No: 1295 Magnolia Ave.

Project Name: Soil Import/Export
Job Number: 12751
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,050 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	82.0 feet
Centerline Dist. to Observer:	82.0 feet
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:	75.5%	14.0%	10.5%	96.22%
Medium Trucks:	48.9%	2.2%	48.9%	1.82%
Heavy Trucks:	47.3%	5.4%	47.3%	1.97%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	73.348
Medium Trucks:	73.228
Heavy Trucks:	73.240

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	4.07	-2.60	-1.20	*-4.74*	0.000	0.000
Medium Trucks:	77.62	-13.16	-2.59	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.14	-12.82	-2.59	-1.20	*-5.22*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.6	67.6	66.3	60.3	68.7	69.3
Medium Trucks:	60.7	56.8	49.3	58.0	64.2	64.2
Heavy Trucks:	65.5	61.5	58.1	62.7	68.9	69.0
Vehicle Noise:	71.4	68.8	67.0	65.5	72.5	72.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.6	67.6	66.3	60.3	68.7	69.3
Medium Trucks:	60.7	56.8	49.3	58.0	64.2	64.2
Heavy Trucks:	65.5	61.5	58.1	62.7	68.9	69.0
Vehicle Noise:	71.4	68.8	67.0	65.5	72.5	72.8

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: With Project Haul Trips
Road Name: Sherborn St.
Lot No: 1168 Sherborn St.

Project Name: Soil Import/Export
Job Number: 12751
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	840 vehicles
Vehicle Speed:	35 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:	130.0 feet
Centerline Dist. to Observer:	130.0 feet
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:	75.5%	14.0%	10.5%	91.62%
Medium Trucks:	48.9%	2.2%	48.9%	1.73%
Heavy Trucks:	47.3%	5.4%	47.3%	6.65%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	129.958
Medium Trucks:	129.890
Heavy Trucks:	129.896

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	65.11	-1.88	-6.33	-1.20	*-4.80*	0.000	0.000
Medium Trucks:	74.83	-19.12	-6.32	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	80.05	-13.28	-6.32	-1.20	*-5.10*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.7	53.7	52.4	46.4	54.8	55.4
Medium Trucks:	48.2	44.3	36.8	45.5	51.7	51.7
Heavy Trucks:	59.2	55.2	51.8	56.5	62.7	62.7
Vehicle Noise:	61.1	57.7	55.2	57.2	63.6	63.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.7	53.7	52.4	46.4	54.8	55.4
Medium Trucks:	48.2	44.3	36.8	45.5	51.7	51.7
Heavy Trucks:	59.2	55.2	51.8	56.5	62.7	62.7
Vehicle Noise:	61.1	57.7	55.2	57.2	63.6	63.8

APPENDIX 8.1:

ON-SITE TRAFFIC NOISE ANALYSIS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Backyard With Wall
Road Name: I-15 Freeway s/o Cajalco Rd.
Lot No: Hotel Pool Area

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	198,280 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	19,828 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	142 feet

Site Data

Barrier Height:	**45.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	378.0 feet
Centerline Dist. to Observer:	452.0 feet
Barrier Distance to Observer:	74.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	919.2 feet
Road Elevation:	892.0 feet
Barrier Elevation:	919.2 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%	94.39%
Medium Trucks:	84.8%	4.9%	10.3%	1.95%
Heavy Trucks:	86.5%	2.7%	10.8%	3.66%

Noise Source Elevations (in feet)

Autos:	892.000		
Medium Trucks:	894.297		
Heavy Trucks:	900.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	462.346
Medium Trucks:	461.914
Heavy Trucks:	460.900

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.54	9.29	-14.59	-1.20	*15.47*	-17.756	-20.756
Medium Trucks:	81.71	-7.56	-14.59	-1.20	*15.20*	-17.724	-20.724
Heavy Trucks:	85.21	-4.83	-14.57	-1.20	*14.56*	-17.647	-20.647

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	65.4	59.3	67.9	68.5
Medium Trucks:	58.4	56.9	50.5	48.9	57.4	57.6
Heavy Trucks:	64.6	63.2	54.2	55.4	63.8	63.9
Vehicle Noise:	70.6	68.9	65.8	61.1	69.6	70.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	51.3	49.4	47.6	41.6	50.2	50.8
Medium Trucks:	40.6	39.1	32.8	31.2	39.7	39.9
Heavy Trucks:	47.0	45.5	36.5	37.8	46.1	46.2
Vehicle Noise:	52.9	51.2	48.1	43.3	51.9	52.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: First Floor With Wall
Road Name: I-15 Freeway s/o Cajalco Rd.
Lot No: Hotel

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	198,280 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	19,828 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	142 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	295.0 feet
Centerline Dist. to Observer:	378.0 feet
Barrier Distance to Observer:	83.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	919.2 feet
Road Elevation:	892.0 feet
Barrier Elevation:	919.2 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%	94.39%
Medium Trucks:	84.8%	4.9%	10.3%	1.95%
Heavy Trucks:	86.5%	2.7%	10.8%	3.66%

Noise Source Elevations (in feet)

Autos:	892.000		
Medium Trucks:	894.297		
Heavy Trucks:	900.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	370.768
Medium Trucks:	370.560
Heavy Trucks:	370.122

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.54	9.29	-13.16	-1.20	*0.03*	-5.300	-8.300
Medium Trucks:	81.71	-7.56	-13.15	-1.20	*0.02*	-5.200	-8.200
Heavy Trucks:	85.21	-4.83	-13.14	-1.20	*0.00*	-4.900	-7.900

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.5	68.6	66.8	60.8	69.4	70.0
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.1
Heavy Trucks:	66.0	64.6	55.6	56.8	65.2	65.3
Vehicle Noise:	72.1	70.3	67.3	62.5	71.0	71.5

Mitigated Noise Levels (with 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:	54.6	53.1	46.7	45.2	53.6	53.9
Heavy Trucks:	61.1	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	66.9	65.1	62.0	57.3	65.9	66.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Second Floor With Wall
Road Name: I-15 Freeway s/o Cajalco Rd.
Lot No: Hotel

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	198,280 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	19,828 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	142 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	295.0 feet
Centerline Dist. to Observer:	378.0 feet
Barrier Distance to Observer:	83.0 feet
Observer Height (Above Pad):	15.0 feet
Pad Elevation:	919.2 feet
Road Elevation:	892.0 feet
Barrier Elevation:	919.2 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%	94.39%
Medium Trucks:	84.8%	4.9%	10.3%	1.95%
Heavy Trucks:	86.5%	2.7%	10.8%	3.66%

Noise Source Elevations (in feet)

Autos:	892.000		
Medium Trucks:	894.297		
Heavy Trucks:	900.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	373.663
Medium Trucks:	373.410
Heavy Trucks:	372.843

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.54	9.29	-13.21	-1.20	*-0.24*	0.000	0.000
Medium Trucks:	81.71	-7.56	-13.20	-1.20	*-0.29*	0.000	0.000
Heavy Trucks:	85.21	-4.83	-13.19	-1.20	*-0.42*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.4	68.5	66.8	60.7	69.3	69.9
Medium Trucks:	59.7	58.2	51.9	50.3	58.8	59.0
Heavy Trucks:	66.0	64.6	55.5	56.8	65.1	65.3
Vehicle Noise:	72.0	70.3	67.2	62.5	71.0	71.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.4	68.5	66.8	60.7	69.3	69.9
Medium Trucks:	59.7	58.2	51.9	50.3	58.8	59.0
Heavy Trucks:	66.0	64.6	55.5	56.8	65.1	65.3
Vehicle Noise:	72.0	70.3	67.2	62.5	71.0	71.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 10/1/2012

Scenario: Third Floor With Wall
Road Name: I-15 Freeway s/o Cajalco Rd.
Lot No: Hotel

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	198,280 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	19,828 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	142 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	295.0 feet
Centerline Dist. to Observer:	378.0 feet
Barrier Distance to Observer:	83.0 feet
Observer Height (Above Pad):	25.0 feet
Pad Elevation:	919.2 feet
Road Elevation:	892.0 feet
Barrier Elevation:	919.2 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%	94.39%
Medium Trucks:	84.8%	4.9%	10.3%	1.95%
Heavy Trucks:	86.5%	2.7%	10.8%	3.66%

Noise Source Elevations (in feet)

Autos:	892.000		
Medium Trucks:	894.297		
Heavy Trucks:	900.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	374.924
Medium Trucks:	374.611
Heavy Trucks:	373.893

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.54	9.29	-13.23	-1.20	*-1.32*	0.000	0.000
Medium Trucks:	81.71	-7.56	-13.22	-1.20	*-1.42*	0.000	0.000
Heavy Trucks:	85.21	-4.83	-13.21	-1.20	*-1.69*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.4	68.5	66.7	60.7	69.3	69.9
Medium Trucks:	59.7	58.2	51.9	50.3	58.8	59.0
Heavy Trucks:	66.0	64.5	55.5	56.8	65.1	65.2
Vehicle Noise:	72.0	70.3	67.2	62.4	71.0	71.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.4	68.5	66.7	60.7	69.3	69.9
Medium Trucks:	59.7	58.2	51.9	50.3	58.8	59.0
Heavy Trucks:	66.0	64.5	55.5	56.8	65.1	65.2
Vehicle Noise:	72.0	70.3	67.2	62.4	71.0	71.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Fourth Floor With Wall
Road Name: I-15 Freeway s/o Cajalco Rd.
Lot No: Hotel

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	198,280	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	19,828	vehicles
Vehicle Speed:	65	mph
Near/Far Lane Distance:	142	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	295.0	feet
Centerline Dist. to Observer:	378.0	feet
Barrier Distance to Observer:	83.0	feet
Observer Height (Above Pad):	35.0	feet
Pad Elevation:	919.2	feet
Road Elevation:	892.0	feet
Barrier Elevation:	919.2	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%	94.39%
Medium Trucks:	84.8%	4.9%	10.3%	1.95%
Heavy Trucks:	86.5%	2.7%	10.8%	3.66%

Noise Source Elevations (in feet)

Autos:	892.000		
Medium Trucks:	894.297		
Heavy Trucks:	900.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	376.446
Medium Trucks:	376.074
Heavy Trucks:	375.207

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	75.54	9.29	-13.25	-1.20	*-3.18*	0.000	0.000
Medium Trucks:	81.71	-7.56	-13.25	-1.20	*-3.34*	0.000	0.000
Heavy Trucks:	85.21	-4.83	-13.23	-1.20	*-3.75*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.4	68.5	66.7	60.7	69.3	69.9
Medium Trucks:	59.7	58.2	51.8	50.3	58.7	59.0
Heavy Trucks:	65.9	64.5	55.5	56.7	65.1	65.2
Vehicle Noise:	72.0	70.2	67.2	62.4	71.0	71.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.4	68.5	66.7	60.7	69.3	69.9
Medium Trucks:	59.7	58.2	51.8	50.3	58.7	59.0
Heavy Trucks:	65.9	64.5	55.5	56.7	65.1	65.2
Vehicle Noise:	72.0	70.2	67.2	62.4	71.0	71.4

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APPENDIX 10.1:

OPERATIONAL NOISE LEVEL CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R1**
Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	455.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	445.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	995.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	952.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	995.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2
Distance Attenuation	455.0	-39.2	-39.2	-39.2	-39.2	-39.2	-39.2
Shielding (Barrier Attenuation)	445.0	-6.7	-6.7	-6.7	-6.7	-6.7	-6.7
Raw (Distance + Barrier)		31.3	28.5	30.2	31.5	31.8	32.3
60 Minute Hourly Adjustment		**31.3**	**28.5**	**30.2**	**31.5**	**31.8**	**32.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R1**
Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	751.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	741.0 feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	995.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	929.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	995.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	15.0	62.0	60.9	62.1	63.6	65.3	66.4
Distance Attenuation	751.0	-34.0	-34.0	-34.0	-34.0	-34.0	-34.0
Shielding (Barrier Attenuation)	741.0	-6.6	-6.6	-6.6	-6.6	-6.6	-6.6
Raw (Distance + Barrier)		21.4	20.3	21.5	23.0	24.7	25.8
60 Minute Hourly Adjustment		**21.4**	**20.3**	**21.5**	**23.0**	**24.7**	**25.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R1**
Source: Trash Enclosure
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	527.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	517.0 feet	*Noise Source Height:*	4.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	995.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	932.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	995.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	69.0	75.0	82.0	87.0	88.5
Distance Attenuation	527.0	-40.5	-40.5	-40.5	-40.5	-40.5	-40.5
Shielding (Barrier Attenuation)	517.0	-7.1	-7.1	-7.1	-7.1	-7.1	-7.1
Raw (Distance + Barrier)		29.7	21.4	27.4	34.4	39.4	40.9
20 Minute Hourly Adjustment		**24.9**	**16.6**	**22.6**	**29.6**	**34.6**	**36.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R1**
Source: Parking Lot
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	584.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	574.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	995.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	995.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	56.7	60.7	63.7	67.1	79.5
Distance Attenuation	584.0	-41.3	-41.3	-41.3	-41.3	-41.3	-41.3
Shielding (Barrier Attenuation)	574.0	-6.9	-6.9	-6.9	-6.9	-6.9	-6.9
Raw (Distance + Barrier)		11.9	8.5	12.5	15.5	18.9	31.3
60 Minute Hourly Adjustment		**11.9**	**8.5**	**12.5**	**15.5**	**18.9**	**31.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R1**
Source: Gas Station Activity
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	601.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	591.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	995.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	995.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	68.2	65.6	66.9	69.5	74.4	82.4
Distance Attenuation	601.0	-41.6	-41.6	-41.6	-41.6	-41.6	-41.6
Shielding (Barrier Attenuation)	591.0	-6.9	-6.9	-6.9	-6.9	-6.9	-6.9
Raw (Distance + Barrier)		19.7	17.1	18.4	21.0	25.9	33.9
60 Minute Hourly Adjustment		**19.7**	**17.1**	**18.4**	**21.0**	**25.9**	**33.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R1**
Source: Car Wash Tunnel
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	585.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	575.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	995.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	995.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	88.3	81.6	92.0	92.6	93.3	93.8
Distance Attenuation	585.0	-35.3	-35.3	-35.3	-35.3	-35.3	-35.3
Shielding (Barrier Attenuation)	575.0	-6.9	-6.9	-6.9	-6.9	-6.9	-6.9
Raw (Distance + Barrier)		46.1	39.4	49.8	50.4	51.1	51.6
60 Minute Hourly Adjustment		**46.1**	**39.4**	**49.8**	**50.4**	**51.1**	**51.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R1**
Source: Car Wash Vacuum Activity
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	618.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	608.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	995.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	995.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	74.6	74.2	75.4	77.2	78.0	78.8
Distance Attenuation	618.0	-41.8	-41.8	-41.8	-41.8	-41.8	-41.8
Shielding (Barrier Attenuation)	608.0	-6.8	-6.8	-6.8	-6.8	-6.8	-6.8
Raw (Distance + Barrier)		26.0	25.6	26.8	28.6	29.4	30.2
60 Minute Hourly Adjustment		**26.0**	**25.6**	**26.8**	**28.6**	**29.4**	**30.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R1**
Source: Outdoor Playground
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	751.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	741.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	995.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	923.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	995.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	63.4	61.7	64.1	67.0	69.7	73.9
Distance Attenuation	751.0	-43.5	-43.5	-43.5	-43.5	-43.5	-43.5
Shielding (Barrier Attenuation)	741.0	-6.7	-6.7	-6.7	-6.7	-6.7	-6.7
Raw (Distance + Barrier)		13.2	11.5	13.9	16.8	19.5	23.7
60 Minute Hourly Adjustment		**13.2**	**11.5**	**13.9**	**16.8**	**19.5**	**23.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R2**
Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,815.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,815.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	983.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	963.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	983.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2
Distance Attenuation	1,815.0	-51.2	-51.2	-51.2	-51.2	-51.2	-51.2
Shielding (Barrier Attenuation)	1,815.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		26.0	23.2	24.9	26.2	26.5	27.0
60 Minute Hourly Adjustment		**26.0**	**23.2**	**24.9**	**26.2**	**26.5**	**27.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R2**
Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	2,777.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,777.0	feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	983.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	929.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	983.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	15.0	62.0	60.9	62.1	63.6	65.3	66.4
Distance Attenuation	2,777.0	-45.3	-45.3	-45.3	-45.3	-45.3	-45.3
Shielding (Barrier Attenuation)	2,777.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		16.7	15.6	16.8	18.3	20.0	21.1
60 Minute Hourly Adjustment		**16.7**	**15.6**	**16.8**	**18.3**	**20.0**	**21.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R2**
Source: Trash Enclosure
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,910.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,910.0	feet	*Noise Source Height:*	4.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	983.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	921.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	983.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	69.0	75.0	82.0	87.0	88.5
Distance Attenuation	1,910.0	-51.6	-51.6	-51.6	-51.6	-51.6	-51.6
Shielding (Barrier Attenuation)	1,910.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		25.7	17.4	23.4	30.4	35.4	36.9
20 Minute Hourly Adjustment		**20.9**	**12.6**	**18.6**	**25.6**	**30.6**	**32.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R2**
Source: Parking Lot
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,775.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,775.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	983.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	918.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	983.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	56.7	60.7	63.7	67.1	79.5
Distance Attenuation	1,775.0	-51.0	-51.0	-51.0	-51.0	-51.0	-51.0
Shielding (Barrier Attenuation)	1,775.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		9.1	5.7	9.7	12.7	16.1	28.5
60 Minute Hourly Adjustment		**9.1**	**5.7**	**9.7**	**12.7**	**16.1**	**28.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R2**
Source: Gas Station Activity
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	2,940.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,940.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	983.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	983.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	68.2	65.6	66.9	69.5	74.4	82.4
Distance Attenuation	2,940.0	-55.4	-55.4	-55.4	-55.4	-55.4	-55.4
Shielding (Barrier Attenuation)	2,940.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		12.8	10.2	11.5	14.1	19.0	27.0
60 Minute Hourly Adjustment		**12.8**	**10.2**	**11.5**	**14.1**	**19.0**	**27.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R2**
Source: Car Wash Tunnel
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	3,108.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	3,108.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	983.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	932.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	983.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	88.3	81.6	92.0	92.6	93.3	93.8
Distance Attenuation	3,108.0	-49.8	-49.8	-49.8	-49.8	-49.8	-49.8
Shielding (Barrier Attenuation)	3,108.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		38.5	31.8	42.2	42.8	43.5	44.0
60 Minute Hourly Adjustment		**38.5**	**31.8**	**42.2**	**42.8**	**43.5**	**44.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R2**
Source: Car Wash Vacuum Activity
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	2,878.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,878.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	983.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	932.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	983.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	74.6	74.2	75.4	77.2	78.0	78.8
Distance Attenuation	2,878.0	-55.2	-55.2	-55.2	-55.2	-55.2	-55.2
Shielding (Barrier Attenuation)	2,878.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		19.4	19.0	20.2	22.0	22.8	23.6
60 Minute Hourly Adjustment		**19.4**	**19.0**	**20.2**	**22.0**	**22.8**	**23.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R2**
Source: Outdoor Playground
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,877.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,877.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	983.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	924.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	983.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	63.4	61.7	64.1	67.0	69.7	73.9
Distance Attenuation	1,877.0	-51.5	-51.5	-51.5	-51.5	-51.5	-51.5
Shielding (Barrier Attenuation)	1,877.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		11.9	10.2	12.6	15.5	18.2	22.4
60 Minute Hourly Adjustment		**11.9**	**10.2**	**12.6**	**15.5**	**18.2**	**22.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R3**
Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,896.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,896.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,088.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	943.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,088.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2
Distance Attenuation	1,896.0	-51.6	-51.6	-51.6	-51.6	-51.6	-51.6
Shielding (Barrier Attenuation)	1,896.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		25.6	22.8	24.5	25.8	26.1	26.6
60 Minute Hourly Adjustment		**25.6**	**22.8**	**24.5**	**25.8**	**26.1**	**26.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R3**
Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	2,604.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,604.0	feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,088.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	929.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,088.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	15.0	62.0	60.9	62.1	63.6	65.3	66.4
Distance Attenuation	2,604.0	-44.8	-44.8	-44.8	-44.8	-44.8	-44.8
Shielding (Barrier Attenuation)	2,604.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		17.2	16.1	17.3	18.8	20.5	21.6
60 Minute Hourly Adjustment		**17.2**	**16.1**	**17.3**	**18.8**	**20.5**	**21.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R3**
Source: Trash Enclosure
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,847.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,847.0	feet	*Noise Source Height:*	4.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,088.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	923.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,088.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	69.0	75.0	82.0	87.0	88.5
Distance Attenuation	1,847.0	-51.3	-51.3	-51.3	-51.3	-51.3	-51.3
Shielding (Barrier Attenuation)	1,847.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		26.0	17.7	23.7	30.7	35.7	37.2
20 Minute Hourly Adjustment		**21.2**	**12.9**	**18.9**	**25.9**	**30.9**	**32.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R3**
Source: Parking Lot
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,834.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,834.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,088.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	923.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,088.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	56.7	60.7	63.7	67.1	79.5
Distance Attenuation	1,834.0	-51.3	-51.3	-51.3	-51.3	-51.3	-51.3
Shielding (Barrier Attenuation)	1,834.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		8.8	5.4	9.4	12.4	15.8	28.2
60 Minute Hourly Adjustment		**8.8**	**5.4**	**9.4**	**12.4**	**15.8**	**28.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R3**
Source: Gas Station Activity
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	2,772.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,772.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,088.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,088.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	68.2	65.6	66.9	69.5	74.4	82.4
Distance Attenuation	2,772.0	-54.9	-54.9	-54.9	-54.9	-54.9	-54.9
Shielding (Barrier Attenuation)	2,772.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		13.3	10.7	12.0	14.6	19.5	27.5
60 Minute Hourly Adjustment		**13.3**	**10.7**	**12.0**	**14.6**	**19.5**	**27.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R3**
Source: Car Wash Tunnel
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	2,876.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,876.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,088.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,088.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	88.3	81.6	92.0	92.6	93.3	93.8
Distance Attenuation	2,876.0	-49.2	-49.2	-49.2	-49.2	-49.2	-49.2
Shielding (Barrier Attenuation)	2,876.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		39.1	32.4	42.8	43.4	44.1	44.6
60 Minute Hourly Adjustment		**39.1**	**32.4**	**42.8**	**43.4**	**44.1**	**44.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R3**
Source: Car Wash Vacuum Activity
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	2,752.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,752.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,088.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,088.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	74.6	74.2	75.4	77.2	78.0	78.8
Distance Attenuation	2,752.0	-54.8	-54.8	-54.8	-54.8	-54.8	-54.8
Shielding (Barrier Attenuation)	2,752.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		19.8	19.4	20.6	22.4	23.2	24.0
60 Minute Hourly Adjustment		**19.8**	**19.4**	**20.6**	**22.4**	**23.2**	**24.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R3**
Source: Outdoor Playground
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,743.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,743.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,088.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	923.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,088.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	63.4	61.7	64.1	67.0	69.7	73.9
Distance Attenuation	1,743.0	-50.8	-50.8	-50.8	-50.8	-50.8	-50.8
Shielding (Barrier Attenuation)	1,743.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		12.6	10.9	13.3	16.2	18.9	23.1
60 Minute Hourly Adjustment		**12.6**	**10.9**	**13.3**	**16.2**	**18.9**	**23.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R4**
Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,240.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,230.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,028.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	949.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,028.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2
Distance Attenuation	1,240.0	-47.9	-47.9	-47.9	-47.9	-47.9	-47.9
Shielding (Barrier Attenuation)	1,230.0	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Raw (Distance + Barrier)		23.1	20.3	22.0	23.3	23.6	24.1
60 Minute Hourly Adjustment		**23.1**	**20.3**	**22.0**	**23.3**	**23.6**	**24.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R4**
Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,254.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,244.0	feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,028.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	929.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,028.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	15.0	62.0	60.9	62.1	63.6	65.3	66.4
Distance Attenuation	1,254.0	-38.4	-38.4	-38.4	-38.4	-38.4	-38.4
Shielding (Barrier Attenuation)	1,244.0	-6.5	-6.5	-6.5	-6.5	-6.5	-6.5
Raw (Distance + Barrier)		17.1	16.0	17.2	18.7	20.4	21.5
60 Minute Hourly Adjustment		**17.1**	**16.0**	**17.2**	**18.7**	**20.4**	**21.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R4**
Source: Trash Enclosure
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,261.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,251.0	feet	*Noise Source Height:*	4.0 feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,028.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	928.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,028.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	69.0	75.0	82.0	87.0	88.5
Distance Attenuation	1,261.0	-48.0	-48.0	-48.0	-48.0	-48.0	-48.0
Shielding (Barrier Attenuation)	1,251.0	-6.5	-6.5	-6.5	-6.5	-6.5	-6.5
Raw (Distance + Barrier)		22.8	14.5	20.5	27.5	32.5	34.0
20 Minute Hourly Adjustment		**18.0**	**9.7**	**15.7**	**22.7**	**27.7**	**29.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R4**
Source: Parking Lot
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,158.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,148.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,028.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	929.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,028.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	56.7	60.7	63.7	67.1	79.5
Distance Attenuation	1,158.0	-47.3	-47.3	-47.3	-47.3	-47.3	-47.3
Shielding (Barrier Attenuation)	1,148.0	-6.6	-6.6	-6.6	-6.6	-6.6	-6.6
Raw (Distance + Barrier)		6.2	2.8	6.8	9.8	13.2	25.6
60 Minute Hourly Adjustment		**6.2**	**2.8**	**6.8**	**9.8**	**13.2**	**25.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R4**
Source: Gas Station Activity
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,218.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,208.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,028.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	929.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,028.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	68.2	65.6	66.9	69.5	74.4	82.4
Distance Attenuation	1,218.0	-47.7	-47.7	-47.7	-47.7	-47.7	-47.7
Shielding (Barrier Attenuation)	1,208.0	-6.5	-6.5	-6.5	-6.5	-6.5	-6.5
Raw (Distance + Barrier)		14.0	11.4	12.7	15.3	20.2	28.2
60 Minute Hourly Adjustment		**14.0**	**11.4**	**12.7**	**15.3**	**20.2**	**28.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R4**
Source: Car Wash Tunnel
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,313.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,303.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,028.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,028.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	88.3	81.6	92.0	92.6	93.3	93.8
Distance Attenuation	1,313.0	-42.4	-42.4	-42.4	-42.4	-42.4	-42.4
Shielding (Barrier Attenuation)	1,303.0	-6.3	-6.3	-6.3	-6.3	-6.3	-6.3
Raw (Distance + Barrier)		39.6	32.9	43.3	43.9	44.6	45.1
60 Minute Hourly Adjustment		**39.6**	**32.9**	**43.3**	**43.9**	**44.6**	**45.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R4**
Source: Car Wash Vacuum Activity
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,368.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,358.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,028.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,028.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	74.6	74.2	75.4	77.2	78.0	78.8
Distance Attenuation	1,368.0	-48.7	-48.7	-48.7	-48.7	-48.7	-48.7
Shielding (Barrier Attenuation)	1,358.0	-6.3	-6.3	-6.3	-6.3	-6.3	-6.3
Raw (Distance + Barrier)		19.6	19.2	20.4	22.2	23.0	23.8
60 Minute Hourly Adjustment		**19.6**	**19.2**	**20.4**	**22.2**	**23.0**	**23.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R4**
Source: Outdoor Playground
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,754.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,744.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,028.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	923.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,028.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	63.4	61.7	64.1	67.0	69.7	73.9
Distance Attenuation	1,754.0	-50.9	-50.9	-50.9	-50.9	-50.9	-50.9
Shielding (Barrier Attenuation)	1,744.0	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Raw (Distance + Barrier)		6.3	4.6	7.0	9.9	12.6	16.8
60 Minute Hourly Adjustment		**6.3**	**4.6**	**7.0**	**9.9**	**12.6**	**16.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R5**
Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,637.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,637.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	976.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	944.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	976.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2
Distance Attenuation	1,637.0	-50.3	-50.3	-50.3	-50.3	-50.3	-50.3
Shielding (Barrier Attenuation)	1,637.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		26.9	24.1	25.8	27.1	27.4	27.9
60 Minute Hourly Adjustment		**26.9**	**24.1**	**25.8**	**27.1**	**27.4**	**27.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R5**
Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,961.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,961.0	feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	976.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	929.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	976.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	15.0	62.0	60.9	62.1	63.6	65.3	66.4
Distance Attenuation	1,961.0	-42.3	-42.3	-42.3	-42.3	-42.3	-42.3
Shielding (Barrier Attenuation)	1,961.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		19.7	18.6	19.8	21.3	23.0	24.1
60 Minute Hourly Adjustment		**19.7**	**18.6**	**19.8**	**21.3**	**23.0**	**24.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R5**
Source: Trash Enclosure
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,635.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,635.0	feet	*Noise Source Height:*	4.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	976.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	925.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	976.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	69.0	75.0	82.0	87.0	88.5
Distance Attenuation	1,635.0	-50.3	-50.3	-50.3	-50.3	-50.3	-50.3
Shielding (Barrier Attenuation)	1,635.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		27.0	18.7	24.7	31.7	36.7	38.2
20 Minute Hourly Adjustment		**22.2**	**13.9**	**19.9**	**26.9**	**31.9**	**33.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R5**
Source: Parking Lot
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,647.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,647.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	976.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	925.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	976.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	56.7	60.7	63.7	67.1	79.5
Distance Attenuation	1,647.0	-50.4	-50.4	-50.4	-50.4	-50.4	-50.4
Shielding (Barrier Attenuation)	1,647.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		9.7	6.3	10.3	13.3	16.7	29.1
60 Minute Hourly Adjustment		**9.7**	**6.3**	**10.3**	**13.3**	**16.7**	**29.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R5**
Source: Gas Station Activity
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	2,096.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,096.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	976.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	976.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	68.2	65.6	66.9	69.5	74.4	82.4
Distance Attenuation	2,096.0	-52.4	-52.4	-52.4	-52.4	-52.4	-52.4
Shielding (Barrier Attenuation)	2,096.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		15.8	13.2	14.5	17.1	22.0	30.0
60 Minute Hourly Adjustment		**15.8**	**13.2**	**14.5**	**17.1**	**22.0**	**30.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R5**
Source: Car Wash Tunnel
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	2,239.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,239.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	976.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	976.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	88.3	81.6	92.0	92.6	93.3	93.8
Distance Attenuation	2,239.0	-47.0	-47.0	-47.0	-47.0	-47.0	-47.0
Shielding (Barrier Attenuation)	2,239.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		41.3	34.6	45.0	45.6	46.3	46.8
60 Minute Hourly Adjustment		**41.3**	**34.6**	**45.0**	**45.6**	**46.3**	**46.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R5**
Source: Car Wash Vacuum Activity
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	2,181.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,181.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	976.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	931.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	976.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	74.6	74.2	75.4	77.2	78.0	78.8
Distance Attenuation	2,181.0	-52.8	-52.8	-52.8	-52.8	-52.8	-52.8
Shielding (Barrier Attenuation)	2,181.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		21.8	21.4	22.6	24.4	25.2	26.0
60 Minute Hourly Adjustment		**21.8**	**21.4**	**22.6**	**24.4**	**25.2**	**26.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/24/2019

Observer Location: **R5**
Source: Outdoor Playground
Condition: Operational

Project Name: Bedford Marketplace
Job Number: 12751
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,561.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,561.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	976.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	923.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	976.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	63.4	61.7	64.1	67.0	69.7	73.9
Distance Attenuation	1,561.0	-49.9	-49.9	-49.9	-49.9	-49.9	-49.9
Shielding (Barrier Attenuation)	1,561.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		13.5	11.8	14.2	17.1	19.8	24.0
60 Minute Hourly Adjustment		**13.5**	**11.8**	**14.2**	**17.1**	**19.8**	**24.0**