APPENDIX G

Hazelden Betty Ford Center

Noise Impact Analysis

City of Rancho Mirage

February 9, 2020

Prepared by

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Hazelden Betty Ford Center

NOISE IMPACT ANALYSIS

CITY OF RANCHO MIRAGE

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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	Hazelden Betty Ford Center
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 any necessary noise mitigation measures for the proposed Hazelden Betty Ford Center development ("Project"). The Project site is located site is located immediately west of Vista del Sol and east of the existing Eisenhower Medical Center Campus in the City of Rancho Mirage. The Project proposes the removal of four inpatient buildings totaling 51,694± square feet and a total of 80 beds. The Alumni Renewal Center will have a reduction of 30 beds. These five buildings will be replaced by two 2-story inpatient buildings, each providing 46 beds for a total of 92 beds. Each new inpatient building will encompass 30,935± square feet for a total of 61,870± square feet.

The project also includes the construction of a new one-story, 22,748± square foot day-treatment building. This new building will house 44-day treatment patients, associated support space, and 6,399 square feet of administrative space including a computer lab and lecture hall. This study has been prepared consistent with applicable City of Rancho Mirage noise standards, and significance criteria based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the 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 14 roadway segments 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 *Hazelden Betty Ford Center Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) To assess the off-site noise level impacts associated with the proposed Project, noise level contours were developed for Existing 2019, Existing plus Ambient (EA), Existing plus Ambient plus Cumulative (EAC), and General Plan Buildout 2040 traffic conditions. The off-site traffic noise analysis shows that the Project-related traffic noise level increases at receiving land uses under all traffic scenarios will be *less than significant*.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the potential noise sources within Hazelden Betty Ford Center site, this analysis estimates the Project-related operational (stationary-source) noise levels at the nearby receiver locations. The Project-related operational noise sources are expected to include air conditioning units, parking lot activity and outdoor courtyard activity.

The analysis shows that the operational noise levels associated with Hazelden Betty Ford Center Project will satisfy the City of Rancho Mirage 55 dBA L_{eq} daytime, 50 dBA L_{eq} evening and 45 dBA L_{eq} nighttime exterior noise level standards at all nearby receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations

CONSTRUCTION NOISE ANALYSIS

Construction-related noise impacts are expected to create short-term and intermittent high-level noise conditions at receivers surrounding the Project site. Using sample reference noise levels to represent the planned construction activities of the Hazelden Betty Ford Center site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. Since the City of Rancho Mirage General Plan and Municipal Codes do not identify specific construction noise level thresholds, a construction noise level threshold is identified based on the National Institute for Occupational Safety and Health (NIOSH) limits. The Project-related short-term construction noise levels are expected to range from 52.1 to 74.6 dBA L_{eq} and will satisfy the 85 dBA L_{eq} NIOSH construction noise level threshold at all receiver locations. Therefore, based on the results of this analysis, all nearby sensitive receiver locations will experience *less than significant* impacts due to Project construction noise levels.

CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The analysis shows the highest construction vibration levels are estimated to range 61.7 to 76.0 VdB at nearby sensitive receiver locations. Based on the vibration standards used in this report, the unmitigated Project construction vibration levels will satisfy the 80 VdB residential vibration thresholds identified by the Federal Transit Administration (FTA) at all the nearby sensitive receiver locations. Therefore, the vibration impacts due to Project construction are considered *less than significant*. Further, vibration levels 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 simultaneously adjacent to the Project site perimeter.

SUMMARY OF CEQA SIGNIFICANCE FINDINGS

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

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Less Than Significant*	-
Operational Noise	9	*Less Than Significant*	-
Construction Noise	10	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

1 INTRODUCTION

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

1.1 SITE LOCATION

The Project site is located immediately west of Vista del Sol and east of the existing Eisenhower Medical Center Campus, in the City of Rancho Mirage, as shown on Exhibit 1-A. The Project site is located north of the Wilshire Palms residential community, south of the Rancho Mirage Country Club and west of undeveloped residential land use.

1.2 PROJECT DESCRIPTION

The proposed changes to the Hazelden Betty Ford Center campus as shown on Exhibit 1-B include the removal of four inpatient buildings totaling 51,694± square feet and a total of 80 beds. The Alumni Renewal Center will have a reduction of 30 beds. These five buildings will be replaced by two 2-story inpatient buildings, each providing 46 beds for a total of 92 beds. Each new inpatient building will encompass 30,935± square feet for a total of 61,870± square feet. The project also includes the construction of a new one-story, 22,748± square foot day-treatment building. This new building will house 44-day treatment patients, associated support space, and 6,399 square feet of administrative space including a computer lab and lecture hall.

As a result, the proposed Project will have a net increase of 56 beds (existing 100 beds; proposed 156 beds) and a net increase of 6,399 square feet of administrative office space. For the purposes of this analysis, it is assumed that the Project will be constructed within a single phase of development with a projected Opening Year of 2023.

EXHIBIT 1-A: LOCATION MAP

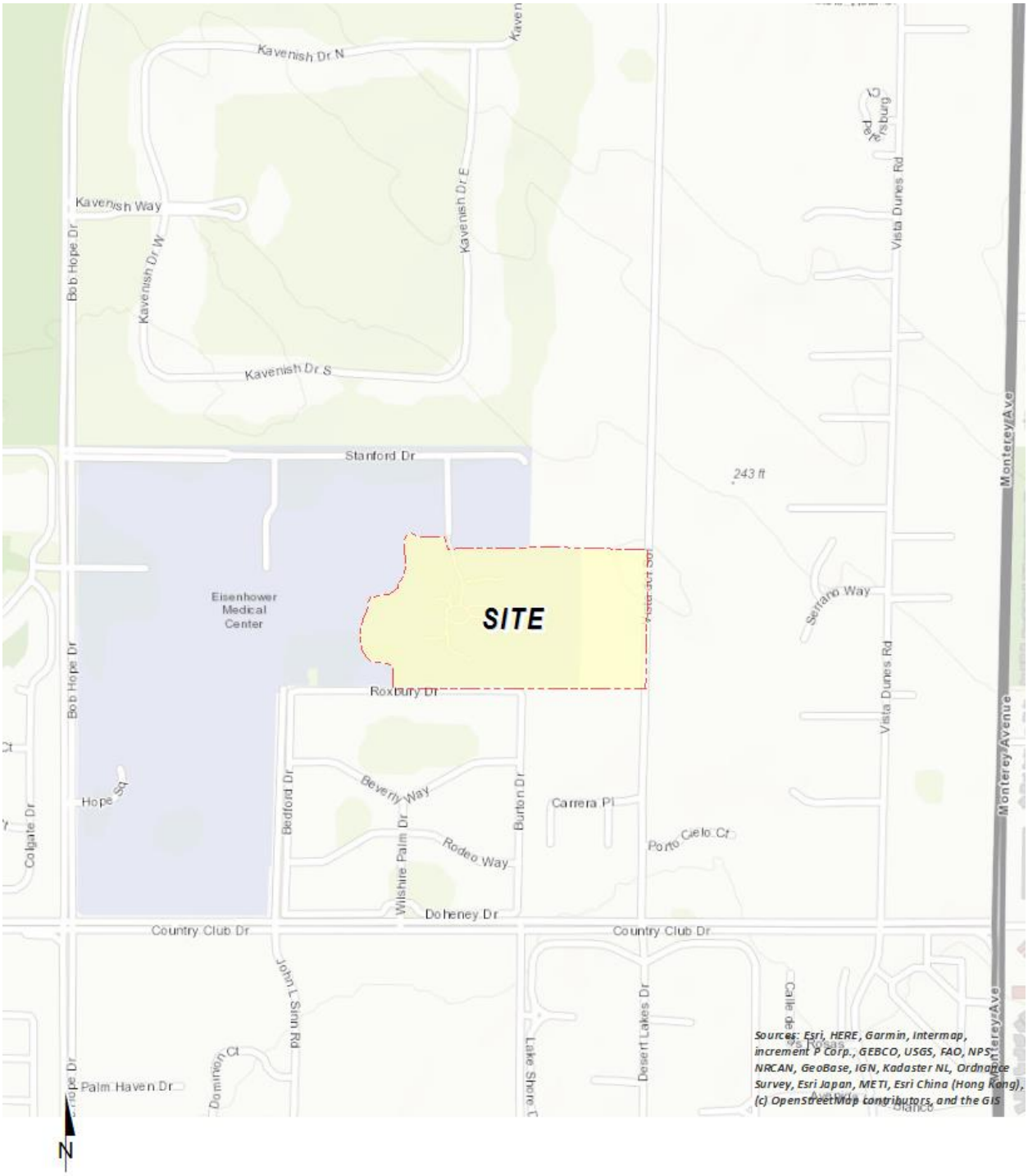
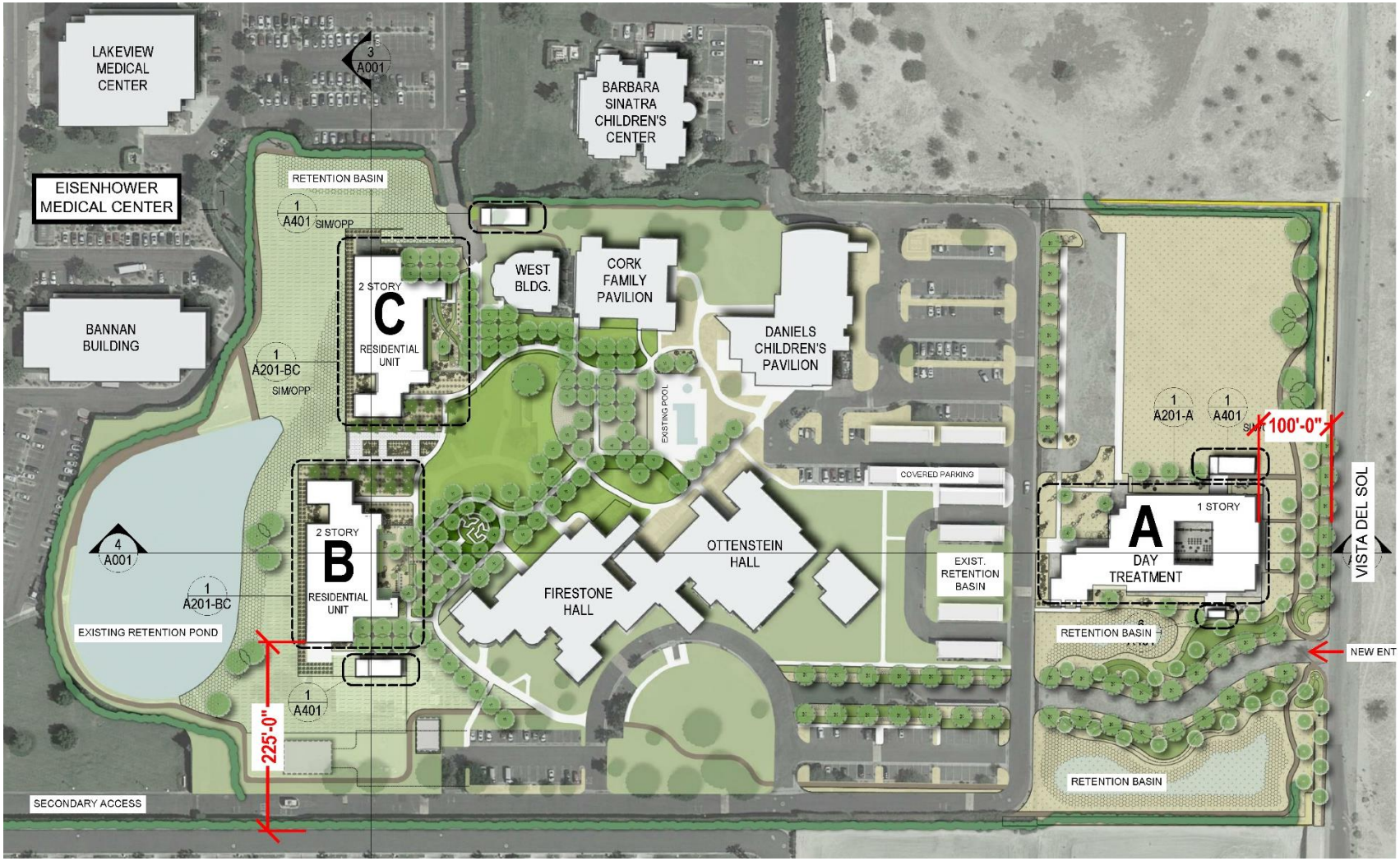


EXHIBIT 1-B: SITE PLAN



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2 FUNDAMENTALS

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

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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

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.

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

2.3 SOUND PROPAGATION

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

2.3.1 GEOMETRIC SPREADING

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

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those

sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (5)

2.3.3 ATMOSPHERIC EFFECTS

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

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The 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)

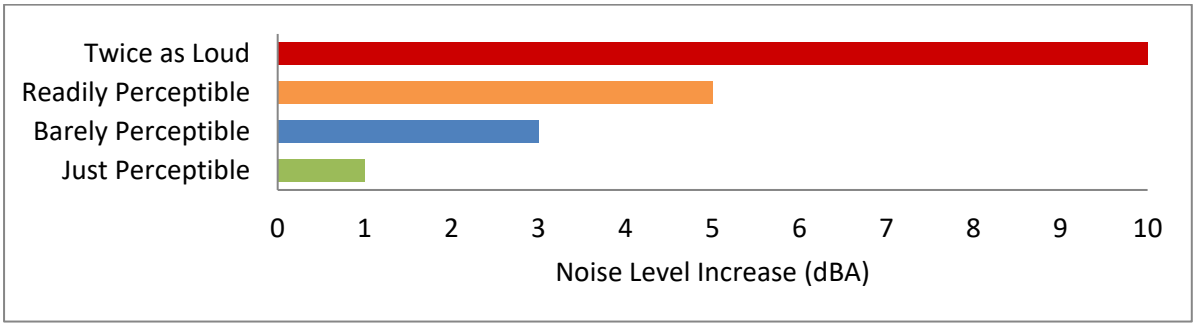
2.7 COMMUNITY RESPONSE TO NOISE

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 EXPOSURE TO HIGH NOISE LEVELS

The Occupational Safety and Health Administration (OSHA) sets legal limits on noise exposure in the workplace. The permissible exposure limit (PEL) for a worker over an eight-hour day is 90 dBA. The OSHA standard uses a 5-dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half. The National Institute for Occupational Safety and Health (NIOSH) has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dBA for eight hours to minimize occupational noise induced hearing loss. NIOSH also recommends a 3 dBA exchange rate so that every increase by 3 dBA doubles the amount of the noise and halves the recommended amount of exposure time. (8)

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

2.9 VIBRATION

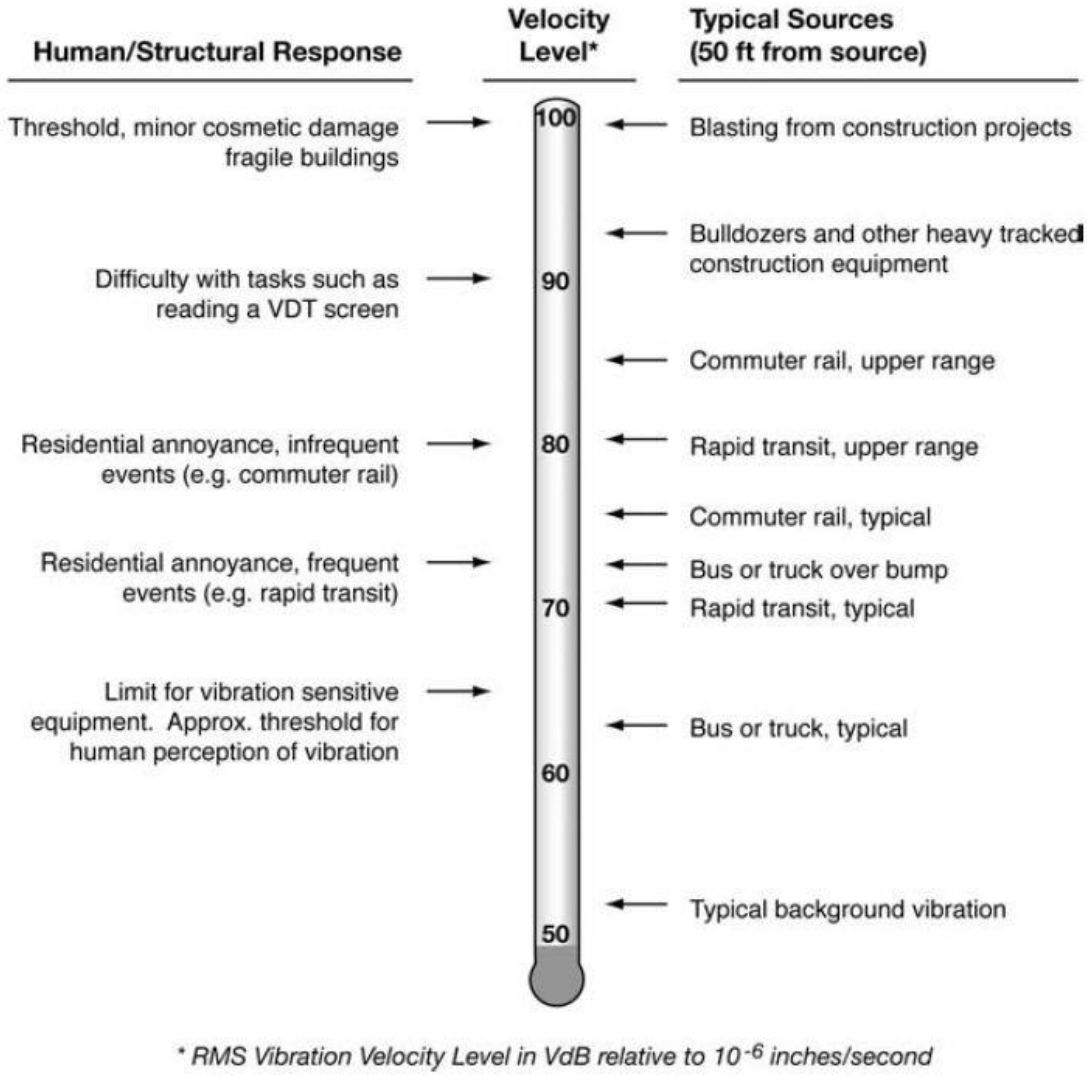
Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (9), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural 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), 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



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

3.2 STATE OF CALIFORNIA BUILDING CODE

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

3.3 CITY OF RANCHO MIRAGE GENERAL PLAN NOISE ELEMENT

The City of Rancho Mirage has adopted a Noise Element of the General Plan (12) to control and abate environmental noise, and to protect the citizens of the City of Rancho Mirage from excessive exposure to noise. The Noise Element is intended to help align the community's various land uses with the existing and future noise environment and thus ensure that any negative effects of noise are minimized or completely avoided.

The noise criteria identified in the City of Rancho Mirage Noise Element are guidelines to evaluate the land use compatibility of transportation related noise. To assist the City in the planning compatible uses, a range of exterior noise thresholds for various land uses have been developed. Particularly sensitive land uses include residences, schools, libraries, churches, hospitals and nursing homes, and destination resort areas. In addition, parks, golf courses, and other outdoor activity areas can be sensitive to noise disturbances. Less sensitive land uses include commercial uses, conventional hotels and motels, and playgrounds. east sensitive to noise are heavy commercial uses, transportation, communication, and utility land uses.

The Noise Level and Land Use Compatibility matrix in the Noise Element shown on Exhibit 3-A provides guidelines to evaluate the acceptability of the transportation related noise level impacts. Single-family residential land uses are considered *normally acceptable* with exterior noise levels below 60 dBA CNEL and *conditionally acceptable* with noise levels below 70 dBA CNEL. Hospitals land uses are considered *normally acceptable* with exterior noise levels below 70 dBA CNEL. For *conditionally acceptable* land use, *new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed*

3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Hazelden Betty Ford Center Project, stationary-source (operational) noise such as the expected air conditioning units, parking lot activity and outdoor courtyard activity are typically evaluated against standards established under a jurisdiction's Municipal Code. The City of Rancho Mirage Municipal Code noise standards are provided in Appendix 3.1. The City of Rancho Mirage Municipal Code, Chapter 8.45 establishes the noise level standards for stationary noise sources. The Project's land use will potentially impact nearby noise-sensitive uses in the Project study area. For nearby noise-sensitive residential land uses in the Project study area, Section 8.45.030 identifies the base exterior noise level standard of 55 dBA L_{eq} during the daytime hours (7:00 a.m. to 6:00 p.m.), 50 dBA L_{eq} during the evening hours (6:00 p.m. to 10:00 p.m.) and 45 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.). (11) Table 3-1 provides a summary of the City of Rancho Mirage operational exterior noise level standards.

TABLE 3-1: OPERATIONAL NOISE STANDARDS

Land Use[1]	Time Period	Exterior Noise Level Standards (dBA L_{eq})[2]
Residential	Daytime (7:00 a.m. to 6:00 p.m.)	55
	Evening (6:00 p.m. to 10:00 p.m.)	50
	Nighttime (10:00 p.m. to 7:00 a.m.)	45

[1] Source: City of Rancho Mirage Municipal Code, Section 8.45.030 Exterior noise level limits (Appendix 3.1).
[2] L_{eq} represents a steady state sound level containing the same total energy as a time varying signal over a given sample period.

EXHIBIT 3-A: NOISE LEVEL AND LAND USE COMPATIBILITY

3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of Hazelden Betty Ford Center, noise from construction activities are typically evaluated against standards established under a City's Municipal Code. The Municipal Code noise standards for construction are described below for the City of Rancho Mirage to determine the potential noise impacts at nearby receiver locations.

To control noise impacts associated with the construction of the proposed Project, the City has established limits to the hours of operation. The City of Rancho Mirage Municipal Code, Section 15.04.030 indicates that construction, shall be limited to the hours of 7:00 a.m. to 7:00 p.m. weekdays. Construction activity is not permitted on Sundays or major holidays. (12) However, the City's General Plan and Municipal Code do not establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes as the *generation of noise levels in excess of standards* or as a *substantial temporary or periodic noise increase*, therefore, the following construction noise level thresholds are used in this noise study.

To evaluate whether the Project will generate potentially significant temporary construction noise levels at off-site sensitive receiver locations, a construction-related noise level threshold is adopted from the *Criteria for Recommended Standard: Occupational Noise Exposure* prepared by the National Institute for Occupational Safety and Health (NIOSH). (13) A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The construction related noise level threshold starts at 85 dBA for more than eight hours per day, and for every 3-dBA increase, the exposure time is cut in half. This results in noise level thresholds of 88 dBA for more than four hours per day, 92 dBA for more than one hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. (13) For the purposes of this analysis, the lowest, more conservative construction noise level threshold of 85 dBA L_{eq} is used as an acceptable threshold for construction noise at the nearby sensitive receiver locations. Since this construction-related noise level threshold represents the energy average of the noise source over a given time, they are expressed as L_{eq} noise levels. Therefore, the noise level threshold of 85 dBA L_{eq} over a period of eight hours or more is used to evaluate the potential Project-related construction noise level impacts at the nearby sensitive receiver locations.

3.6 VIBRATION STANDARDS

The City of Rancho Mirage has not identified or adopted specific, quantified vibration level standards. However, the United States Department of Transportation Federal Transit Administration (FTA) provides guidelines for maximum-acceptable vibration criteria for different types of land uses. These guidelines allow 80 VdB for residential uses and buildings where people normally sleep, and 83 VdB for institutional land uses typically occupied during the daytime hours. (9) Construction activities can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. The FTA guidelines provide a substantiated basis for determining the relative significance of potential Project vibration impacts due to on-site construction activities.

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

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

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

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

While the City of Rancho Mirage 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 Palm Springs Airport (PSP) is located roughly 6 miles north west of the Project site Since the Project is located more than two miles away from the nearest airport, the potential impacts are considered *less than significant,* and no further noise analysis is provided under Guideline C.

4.2 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (15) Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (16) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft

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

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (15) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, 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.

4.3 NON-NOISE-SENSITIVE RECEIVERS

The City of Rancho Mirage General Plan Noise Element (Figure 8-2), *Land Use Compatibility for Community Noise Exposure* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise levels for non-noise-sensitive land uses is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* per the *Land Use Compatibility for Community Noise Exposure*.

To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria were used. When the without Project noise levels at the non-noise-sensitive land uses are below the *normally acceptable* 70 dBA CNEL compatibility criteria, a *readily perceptible* 5 dBA or greater noise level increase is considered a significant impact. When the without Project noise levels are greater than the *normally acceptable* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the City of Rancho Mirage General Plan Noise Element (Figure 8-2) *Land Use Compatibility for Community Noise Exposure normally acceptable* 70 dBA CNEL exterior noise level criteria.

4.4 SIGNIFICANCE CRITERIA SUMMARY

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

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
    - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
    - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase; or
    - already exceed 65 dBA CNEL, and the Project creates a community noise level increase of greater than 1.5 dBA CNEL (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g., office, commercial, industrial):
    - are less than the City of Rancho Mirage General Plan Noise Element (Figure 8-2), *normally acceptable* 70 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
    - are greater than the City of Rancho Mirage General Plan Noise Element (Figure 8-2), *normally acceptable* 70 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project noise level increase.

OPERATIONAL NOISE

- If Project-related operational (stationary-source) noise levels exceed the base exterior noise level standard of 55 dBA L_{eq} during the daytime hours (7:00 a.m. to 6:00 p.m.), 50 dBA L_{eq} during the evening hours (6:00 p.m. to 10:00 p.m.) and 45 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.) for noise-sensitive residential and institutional uses in the Project study area. (11)
- When the noise levels at existing and future noise-sensitive land uses (e.g., residential, etc.):
    - are less than 60 dBA L_{eq} and the Project creates a readily perceptible 5 dBA L_{eq} or greater Project-related noise level increase; or
    - range from 60 to 65 dBA L_{eq} and the Project creates a barely perceptible 3 dBA L_{eq} or greater Project-related noise level increase; or
    - already exceed 65 dBA L_{eq}, and the Project creates a community noise level impact of greater than 1.5 dBA L_{eq} (FICON, 1992).

CONSTRUCTION NOISE & VIBRATION

- If Project-related construction activities create noise levels which exceed the 85 dBA L_{eq} acceptable noise level threshold at the nearby sensitive receiver locations (NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure).
- If short-term Project generated construction vibration levels exceed the FTA vibration standards of 80 VdB at residential uses (Federal Transit Administration, Transit Noise and Vibration Impact Assessment).

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site Traffic[1]	Noise-Sensitive[1,2]	If ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		If ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		If ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
	Non-Noise-Sensitive[1,2]	If ambient is < 70 dBA CNEL	≥ 5 dBA CNEL Project increase	
		If ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Operational	Residential[3]	Exterior Noise Level Standards	See Table 3-1	
		If ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA L_{eq} Project increase	
		If ambient is 60 - 65 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase	
		If ambient is > 65 dBA L_{eq}[1]	≥ 1.5 dBA L_{eq} Project increase	
Construction	Noise-Sensitive	Permitted between 7:00 a.m. to 6:00 p.m. Monday to Saturdays; with no activity allowed on Sundays or holidays.[4]		
		Noise Level Threshold[5]	85 dBA L_{eq}	n/a
		Vibration Level Threshold[6]	80 VdB	n/a

[1] Source: FICON, 1992.
[2] Source: City of Rancho Mirage General Plan Noise Element.
[3] Source: City of Rancho Mirage General Plan Municipal Code, Section 8.45.030
[4] Source: City of Rancho Mirage General Plan Municipal Code, Section15.04.030
[5] Acceptable threshold for construction noise based on the Criteria for Recommended Standard: Occupational Noise Exposure prepared by the National Institute for Occupational Safety and Health.
[6] Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

5 EXISTING NOISE LEVEL MEASUREMENTS

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

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent 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*. (9)

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

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

5.3 NOISE MEASUREMENT RESULTS

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

- Location L1 represents the noise levels north of the Project site near the Barbara Sinatra Children's center. The noise levels at this location consist primarily of parking lot vehicle movements. The noise level measurements collected show an overall 24-hour exterior noise level of 57.4 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 49.3 dBA L_{eq} with an average nighttime noise level of 51.1 dBA L_{eq}.
- Location L2 represents the noise levels east of the project site on Vista Del Sol next to undeveloped residential land. The noise level measurements collected show an overall 24-hour exterior noise level of 57.6 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 49.2 dBA L_{eq} with an average nighttime noise level of 51.2 dBA L_{eq}.
- Location L3 represents the noise levels south of the project site near Oral, Facial and Implant surgery offices. The 24-hour CNEL indicates that the overall exterior noise level is 58.1 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 55.7 dBA L_{eq} with an average nighttime noise level of 49.9 dBA L_{eq}. Background traffic noise from Country Club Drive and parking lot vehicle movements represent the primary source of noise at this location.
- Location L4 represents the noise levels near the western boundary of the Project site by the Bannan Building. The noise level measurements collected show an overall 24-hour exterior noise level of 59.1 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 55.8 dBA L_{eq} with an average nighttime noise level of 51.5 dBA L_{eq}. The noise levels at this location consist primarily of parking lot vehicle movements.
- Location L5 represents the noise levels northwest of Project site near Hal B. Wallis Building Cardiology. The 24-hour CNEL indicates that the overall exterior noise level is 63.7 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 60.8 dBA L_{eq} with an average nighttime noise level of 56.2 dBA L_{eq}. Traffic on Stanford Drive and parking lot vehicle movements 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 the arterial roadway network. The 24-hour existing noise level measurements shown on Table 5-1 present the existing ambient noise conditions.

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

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]		
		Daytime	Evening	Nighttime
L1	Located north of the Project site near the Barbara Sinatra Children's center.	51.5	49.7	47.4
L2	Located east of the project site on Vista Del Sol next to vacant residential land.	51.0	49.0	48.9
L3	Located south of the project site near Oral, Facial and Implant surgery offices.	56.2	52.4	49.9
L4	Located near the western boundary of the Project site by the Bannan Building.	56.3	52.4	51.5
L5	Located northwest of Project site near Hal B. Wallis Building Cardiology.	61.6	52.2	56.2

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

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

6 METHODS AND PROCEDURES

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

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (18) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (19) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (5)

6.1.1 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the 14 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Rancho Mirage General Plan Circulation Element, and the posted vehicle speeds. Consistent with *Hazelden Betty Ford Center Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) the off-site traffic noise analysis maintains a peak hour to average daily traffic (peak-to-daily) relationship of approximately 8.38% and includes the following traffic scenarios.

- Existing (2019)
- Existing Plus Project (E+P)
- Existing Plus Ambient Growth Plus Project (EAP) (2023)
- Existing Plus Ambient Growth Plus Cumulative Projects Plus Project (EAPC) (2023)
- General Plan Buildout (2040) Without Project Conditions
- General Plan Buildout (2040) With Project Conditions

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

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Land Use[1]	Classification[1]	Distance from Centerline to Receiving Land Use (Feet)[2]	Vehicle Speed (mph)
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	Minor Arterial	55'	45
2	Bob Hope Dr.	s/o Street A	Hospital	Minor Arterial	55'	45
3	Bob Hope Dr.	s/o Country Club Dr.	Office	Minor Arterial	55'	45
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	Local	30'	25
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	Local	30'	25
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	Local	30'	25
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	Local	30'	25
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	Local	30'	25
9	Street A	e/o Bob Hope Dr.	Hospital	Local	30'	25
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	Local	30'	25
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	Major Collector	55'	45
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	Minor Arterial	55'	50
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	Minor Arterial	55'	50
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	Minor Arterial	55'	50

[1] Sources: City of Rancho Mirage General Plan, Chapter 3, Exhibit 8, Circulation Roadway Plan.

[2] Distance to receiving land use is based upon the right-of-way distances for each roadway classification provided in the General Plan Circulation Element. "RW" = Location of the respective noise contour falls within the right-of-way of the road. “POS” = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]							
			Existing		Existing + Ambient (EA)		Existing + Ambient + Cumulative (EAC)		General Plan Buildout	
			Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Bob Hope Dr.	n/o MacMillan Wy.	23,723	23,779	25,678	25,734	27,108	27,164	29,881	29,937
2	Bob Hope Dr.	s/o Street A	19,193	19,249	20,775	20,831	22,205	22,261	24,487	24,543
3	Bob Hope Dr.	s/o Country Club Dr.	19,765	19,821	21,394	21,450	22,564	22,620	24,882	24,938
4	John L. Sinn Rd.	s/o Street A	3,755	3,923	4,065	4,233	4,065	4,233	4,656	4,824
5	Joe Friend Ln.	s/o MacMillan Wy.	2,050	2,106	2,219	2,275	2,219	2,275	2,503	2,559
6	Vista Del Sol	n/o Betty Ford Wy.	119	175	129	185	213	269	2,199	2,339
7	Vista Del Sol	n/o Country Club Dr.	1,252	1,476	1,355	1,579	1,439	1,663	2,199	2,339
8	MacMillan Wy.	e/o Bob Hope Dr.	3,374	3,430	3,652	3,708	3,652	3,708	4,079	4,135
9	Street A	e/o Bob Hope Dr.	2,074	2,130	2,245	2,301	2,245	2,301	2,531	2,587
10	Betty Ford Wy.	e/o Joe Friend Ln.	887	1,167	960	1,240	960	1,240	1,364	1,646
11	Country Club Dr.	w/o Bob Hope Dr.	9,680	9,792	10,478	10,590	10,648	10,760	24,124	24,236
12	Country Club Dr.	e/o Bob Hope Dr.	14,794	14,906	16,014	16,126	16,706	16,818	27,458	27,570
13	Country Club Dr.	e/o John L. Sinn Rd.	18,931	19,043	20,491	20,603	21,007	21,119	27,458	27,570
14	Country Club Dr.	e/o Vista Del Sol	19,753	20,033	21,382	21,662	21,838	22,118	27,532	27,728

[1] Source: Hazelden Betty Ford Center Traffic Impact Analysis

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

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

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

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

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

[1] Source: Typical Southern California vehicle mix and the County of Riverside Office of Industrial Hygiene.

6.2 VIBRATION ASSESSMENT

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 6-5. 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: $L_{VdB}(D) = L_{VdB}(25\text{ ft}) - 30\log(D/25)$

TABLE 6-5: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Vibration Decibels (VdB) at 25 feet[1]
Small bulldozer	58
Jackhammer	79
Loaded Trucks	86
Large bulldozer	87

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

7 OFF-SITE TRANSPORTATION NOISE ANALYSIS

To assess the off-site transportation CNEL noise level impacts associated with development of the proposed Project, noise contours were developed based on *Hazelden Betty Ford Center Traffic Impact Analysis*. (2) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- Existing Without / With Project: This scenario refers to the existing present-day 2019 noise conditions, without and with the development of the full Project. The existing with Project scenario will not actually occur since the Project would not be fully constructed and operational until 2023 conditions.
- Existing plus Ambient (EA) 2023 Without / With Project: This scenario refers to the existing noise conditions plus the estimated 4 years of background growth in ambient traffic conditions without and with the development of the full Project.
- Existing plus Ambient plus Cumulative (EAC) 2023 Without / With Project: This scenario refers to the existing plus ambient plus cumulative noise conditions at 2023 without and with the proposed Project.
- General Plan Buildout 2040 Without / With Project: This scenario refers to the future General Plan buildout conditions at Year 2040 without and with the proposed Project. This scenario represents buildout of the General Plan land use and includes all cumulative projects identified in the Traffic Impact Analysis.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 and 7-8 present a summary of the exterior traffic noise levels for each traffic condition. Appendix 7.1 includes the traffic noise level contours worksheets for each traffic condition.

TABLE 7-1: EXISTING 2019 WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	72.6	82	178	383
2	Bob Hope Dr.	s/o Street A	Hospital	71.7	72	154	332
3	Bob Hope Dr.	s/o Country Club Dr.	Office	71.8	73	157	339
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	62.0	RW	RW	41
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	59.4	RW	RW	RW
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	47.1	RW	RW	RW
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	57.3	RW	RW	RW
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	61.6	RW	RW	38
9	Street A	e/o Bob Hope Dr.	Hospital	59.5	RW	RW	RW
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	55.8	RW	RW	RW
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	68.5	RW	94	203
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	71.6	71	152	329
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	72.7	83	180	387
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	72.9	86	185	398

[1] Sources: City of Rancho Mirage General Plan, Chapter 3, Exhibit 8, Circulation Roadway Plan.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road. “POS” = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

TABLE 7-2: EXISTING 2019 WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	72.6	83	178	383
2	Bob Hope Dr.	s/o Street A	Hospital	71.7	72	155	333
3	Bob Hope Dr.	s/o Country Club Dr.	Office	71.9	73	158	340
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	62.2	RW	RW	42
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	59.5	RW	RW	RW
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	48.7	RW	RW	RW
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	58.0	RW	RW	RW
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	61.6	RW	RW	39
9	Street A	e/o Bob Hope Dr.	Hospital	59.6	RW	RW	RW
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	57.0	RW	RW	RW
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	68.6	RW	95	205
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	71.7	71	153	330
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	72.7	84	180	389
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	73.0	87	187	402

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road. “POS” = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

TABLE 7-3: EA 2023 WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	73.0	87	187	403
2	Bob Hope Dr.	s/o Street A	Hospital	72.1	75	163	350
3	Bob Hope Dr.	s/o Country Club Dr.	Office	72.2	77	166	357
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	62.4	RW	RW	43
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	59.8	RW	RW	RW
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	47.4	RW	RW	RW
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	57.6	RW	RW	RW
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	61.9	RW	RW	40
9	Street A	e/o Bob Hope Dr.	Hospital	59.8	RW	RW	RW
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	56.1	RW	RW	RW
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	68.9	RW	99	214
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	72.0	75	161	346
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	73.1	88	189	408
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	73.2	90	195	420

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road. “POS” = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

TABLE 7-4: EA 2023 WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	73.0	87	188	404
2	Bob Hope Dr.	s/o Street A	Hospital	72.1	76	163	351
3	Bob Hope Dr.	s/o Country Club Dr.	Office	72.2	77	166	358
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	62.6	RW	RW	44
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	59.9	RW	RW	RW
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	49.0	RW	RW	RW
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	58.3	RW	RW	RW
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	62.0	RW	RW	41
9	Street A	e/o Bob Hope Dr.	Hospital	59.9	RW	RW	30
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	57.2	RW	RW	RW
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	68.9	RW	100	216
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	72.0	75	162	348
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	73.1	88	190	410
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	73.3	91	197	424

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road. “POS” = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

TABLE 7-5: EAC 2023 WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	73.2	90	194	418
2	Bob Hope Dr.	s/o Street A	Hospital	72.4	79	170	366
3	Bob Hope Dr.	s/o Country Club Dr.	Office	72.4	80	172	370
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	62.4	RW	RW	43
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	59.8	RW	RW	RW
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	49.6	RW	RW	RW
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	57.9	RW	RW	RW
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	61.9	RW	RW	40
9	Street A	e/o Bob Hope Dr.	Hospital	59.8	RW	RW	RW
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	56.1	RW	RW	RW
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	68.9	RW	100	216
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	72.2	77	165	356
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	73.2	89	193	415
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	73.3	92	198	426

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road. “POS” = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

TABLE 7-6: EAC 2023 WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	73.2	90	194	419
2	Bob Hope Dr.	s/o Street A	Hospital	72.4	79	170	367
3	Bob Hope Dr.	s/o Country Club Dr.	Office	72.4	80	172	371
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	62.6	RW	RW	44
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	59.9	RW	RW	RW
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	50.6	RW	RW	RW
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	58.5	RW	RW	RW
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	62.0	RW	RW	41
9	Street A	e/o Bob Hope Dr.	Hospital	59.9	RW	RW	30
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	57.2	RW	RW	RW
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	69.0	RW	101	218
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	72.2	77	166	358
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	73.2	90	193	417
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	73.4	93	199	430

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road. “POS” = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

TABLE 7-7: GENERAL PLAN BUILDOUT 2040 WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	73.6	96	207	446
2	Bob Hope Dr.	s/o Street A	Hospital	72.8	84	181	391
3	Bob Hope Dr.	s/o Country Club Dr.	Office	72.8	85	183	395
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	63.0	RW	RW	47
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	60.3	RW	RW	31
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	59.7	RW	RW	RW
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	59.7	RW	RW	RW
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	62.4	RW	RW	43
9	Street A	e/o Bob Hope Dr.	Hospital	60.3	RW	RW	32
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	57.6	RW	RW	RW
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	72.5	80	173	373
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	74.3	107	230	496
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	74.3	107	230	496
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	74.3	107	231	497

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road. “POS” = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

TABLE 7-8: GENERAL PLAN BUILDOUT 2040 WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	73.6	96	207	447
2	Bob Hope Dr.	s/o Street A	Hospital	72.8	84	182	391
3	Bob Hope Dr.	s/o Country Club Dr.	Office	72.9	85	184	396
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	63.1	RW	RW	48
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	60.4	RW	RW	32
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	60.0	RW	RW	30
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	60.0	RW	RW	30
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	62.5	RW	RW	44
9	Street A	e/o Bob Hope Dr.	Hospital	60.4	RW	RW	32
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	58.5	RW	RW	RW
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	72.5	81	174	374
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	74.3	107	231	498
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	74.3	107	231	498
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	74.4	108	232	499

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road. "POS" = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

7.2 EXISTING 2019 PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report for informational purposes and to fully analyze all the existing traffic scenarios identified in the *Hazelden Betty Ford Center Traffic Impact Analysis* prepared by Urban Crossroads, Inc. However, the analysis of existing off-site traffic noise levels plus traffic noise generated by the proposed Project scenario will not actually occur since the Project would not be fully constructed and operational until future year 2023 plus cumulative conditions. Therefore, no mitigation measures are considered to reduce the Existing Plus Project traffic noise level increases. The EAC 2023 and General Plan Buildout 2040 traffic noise conditions that include all cumulative projects are used to determine the significance of the Project off-site traffic noise level increases on the study area roadway segments.

Table 7-1 shows the Existing 2019 without Project conditions CNEL noise levels. The Existing 2019 without Project exterior noise levels are expected to range from 47.1 to 72.9 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing 2019 with Project conditions range from 48.7 to 73.0 dBA CNEL. Table 7-9

shows that the Project off-site traffic noise level increases range from 0.0 to 1.6 dBA CNEL on the study area roadway segments.

7.3 EA 2023 PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the EA 2023 without Project conditions CNEL noise levels. The EA 2023 without Project exterior noise levels are expected to range from 47.4 to 73.26 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the EA 2023 with Project conditions range from 49.0 to 73.3 dBA CNEL. Table 7-10 shows that the Project off-site traffic noise level increases range from 0.0 to 1.6 dBA CNEL.

7.4 EAC 2023 PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-5 presents the EAC 2023 without Project conditions CNEL noise levels. The EAC 2023 without Project exterior noise levels are expected to range from 49.6 to 73.3 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-6 shows the EAC 2023 with Project conditions range from 50.6 to 73.4 dBA CNEL. Table 7-11 shows that the Project off-site traffic noise level increases range from 0.0 to 1.1 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

7.5 GENERAL PLAN BUILDOUT 2040 PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-7 presents the General Plan Buildout 2040 without Project conditions CNEL noise levels. The General Plan Buildout 2040 without Project exterior noise levels are expected to range from 57.6 to 74.3 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-8 shows the General Plan Buildout 2040 with Project conditions range from 58.5 to 74.4 dBA CNEL. Table 7-12 shows that the Project off-site traffic noise level increases range from 0.0 to 0.9 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

TABLE 7-9: EXISTING 2019 WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Noise-Sensitive Land Use?	CNEL at Receiving Land Use (dBA)[1]			Noise Level Increase Significance Criteria[2]	
					No Project	With Project	Project Increase	Criteria	Exceeded?
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	Yes	72.6	72.6	0.0	1.5	No
2	Bob Hope Dr.	s/o Street A	Hospital	Yes	71.7	71.7	0.0	1.5	No
3	Bob Hope Dr.	s/o Country Club Dr.	Office	No	71.8	71.9	0.1	3.0	No
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	Yes	62.0	62.2	0.2	3.0	No
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	Yes	59.4	59.5	0.1	5.0	No
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	Yes	47.1	48.7	1.6	5.0	No
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	Yes	57.3	58.0	0.7	5.0	No
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	Yes	61.6	61.6	0.0	3.0	No
9	Street A	e/o Bob Hope Dr.	Hospital	Yes	59.5	59.6	0.1	5.0	No
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	Yes	55.8	57.0	1.2	5.0	No
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	Yes	68.5	68.6	0.1	1.5	No
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	Yes	71.6	71.7	0.1	1.5	No
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	Yes	72.7	72.7	0.0	1.5	No
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	Yes	72.9	73.0	0.1	1.5	No

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

[2] Does the Project create an off-site transportation related noise level increase exceeding the significance criteria (Table 4-1)?

"RW" = Location of the respective noise contour falls within the right-of-way of the road. "POS" = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

TABLE 7-10: EA 2023 WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Noise-Sensitive Land Use?	CNEL at Receiving Land Use (dBA)[1]			Noise Level Increase Significance Criteria[2]	
					No Project	With Project	Project Increase	Criteria	Exceeded?
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	Yes	73.0	73.0	0.0	1.5	No
2	Bob Hope Dr.	s/o Street A	Hospital	Yes	72.1	72.1	0.0	1.5	No
3	Bob Hope Dr.	s/o Country Club Dr.	Office	No	72.2	72.2	0.0	3.0	No
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	Yes	62.4	62.6	0.2	3.0	No
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	Yes	59.8	59.9	0.1	5.0	No
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	Yes	47.4	49.0	1.6	5.0	No
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	Yes	57.6	58.3	0.7	5.0	No
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	Yes	61.9	62.0	0.1	3.0	No
9	Street A	e/o Bob Hope Dr.	Hospital	Yes	59.8	59.9	0.1	5.0	No
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	Yes	56.1	57.2	1.1	5.0	No
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	Yes	68.9	68.9	0.0	1.5	No
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	Yes	72.0	72.0	0.0	1.5	No
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	Yes	73.1	73.1	0.0	1.5	No
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	Yes	73.2	73.3	0.1	1.5	No

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

[2] Does the Project create an off-site transportation related noise level increase exceeding the significance criteria (Table 4-1)?

"RW" = Location of the respective noise contour falls within the right-of-way of the road. “POS” = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

TABLE 7-11: EAC 2023 WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Noise-Sensitive Land Use?	CNEL at Receiving Land Use (dBA)[1]			Noise Level Increase Significance Criteria[2]		Significant Impact?
					No Project	With Project	Project Increase	Criteria	Exceeded?	
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	Yes	73.2	73.2	0.0	1.5	No	No
2	Bob Hope Dr.	s/o Street A	Hospital	Yes	72.4	72.4	0.0	1.5	No	No
3	Bob Hope Dr.	s/o Country Club Dr.	Office	No	72.4	72.4	0.0	3.0	No	No
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	Yes	62.4	62.6	0.2	3.0	No	No
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	Yes	59.8	59.9	0.1	5.0	No	No
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	Yes	49.6	50.6	1.0	5.0	No	No
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	Yes	57.9	58.5	0.6	5.0	No	No
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	Yes	61.9	62.0	0.1	3.0	No	No
9	Street A	e/o Bob Hope Dr.	Hospital	Yes	59.8	59.9	0.1	5.0	No	No
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	Yes	56.1	57.2	1.1	5.0	No	No
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	Yes	68.9	69.0	0.1	1.5	No	No
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	Yes	72.2	72.2	0.0	1.5	No	No
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	Yes	73.2	73.2	0.0	1.5	No	No
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	Yes	73.3	73.4	0.1	1.5	No	No

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

[2] Does the Project create an off-site transportation related noise level increase exceeding the significance criteria (Table 4-1)?

"RW" = Location of the respective noise contour falls within the right-of-way of the road. “POS” = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

TABLE 7-12: GENERAL PLAN BUILDOUT 2040 WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Noise-Sensitive Land Use?	CNEL at Receiving Land Use (dBA)[1]			Noise Level Increase Significance Criteria[2]		Significant Impact?
					No Project	With Project	Project Increase	Criteria	Exceeded?	
1	Bob Hope Dr.	n/o MacMillan Wy.	POS	Yes	73.6	73.6	0.0	1.5	No	No
2	Bob Hope Dr.	s/o Street A	Hospital	Yes	72.8	72.8	0.0	1.5	No	No
3	Bob Hope Dr.	s/o Country Club Dr.	Office	No	72.8	72.9	0.1	3.0	No	No
4	John L. Sinn Rd.	s/o Street A	MDR/Hospital	Yes	63.0	63.1	0.1	3.0	No	No
5	Joe Friend Ln.	s/o MacMillan Wy.	Hospital	Yes	60.3	60.4	0.1	3.0	No	No
6	Vista Del Sol	n/o Betty Ford Wy.	RE/Hospital	Yes	59.7	60.0	0.3	5.0	No	No
7	Vista Del Sol	n/o Country Club Dr.	RE/Hospital	Yes	59.7	60.0	0.3	5.0	No	No
8	MacMillan Wy.	e/o Bob Hope Dr.	POS/Hospital	Yes	62.4	62.5	0.1	3.0	No	No
9	Street A	e/o Bob Hope Dr.	Hospital	Yes	60.3	60.4	0.1	3.0	No	No
10	Betty Ford Wy.	e/o Joe Friend Ln.	Hospital	Yes	57.6	58.5	0.9	5.0	No	No
11	Country Club Dr.	w/o Bob Hope Dr.	LDR/Office	Yes	72.5	72.5	0.0	1.5	No	No
12	Country Club Dr.	e/o Bob Hope Dr.	Hospital/Office	Yes	74.3	74.3	0.0	1.5	No	No
13	Country Club Dr.	e/o John L. Sinn Rd.	MDR/Office/Public/RE	Yes	74.3	74.3	0.0	1.5	No	No
14	Country Club Dr.	e/o Vista Del Sol	LDR/Office	Yes	74.3	74.4	0.1	1.5	No	No

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

[2] Does the Project create an off-site transportation related noise level increase exceeding the significance criteria (Table 4-1)?

"RW" = Location of the respective noise contour falls within the right-of-way of the road. “POS” = Private Open Space; "MDR" = Medium Density Residential; "RE" = Residential Estate; "LDR" = Low Density Residential.

8 SENSITIVE RECEIVER LOCATIONS

To assess the potential for long-term short-term construction noise impacts, the following sensitive receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

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

R1: Located approximately 60 feet north of the Project site, R1 the Barbara Sinatra Children's Center. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

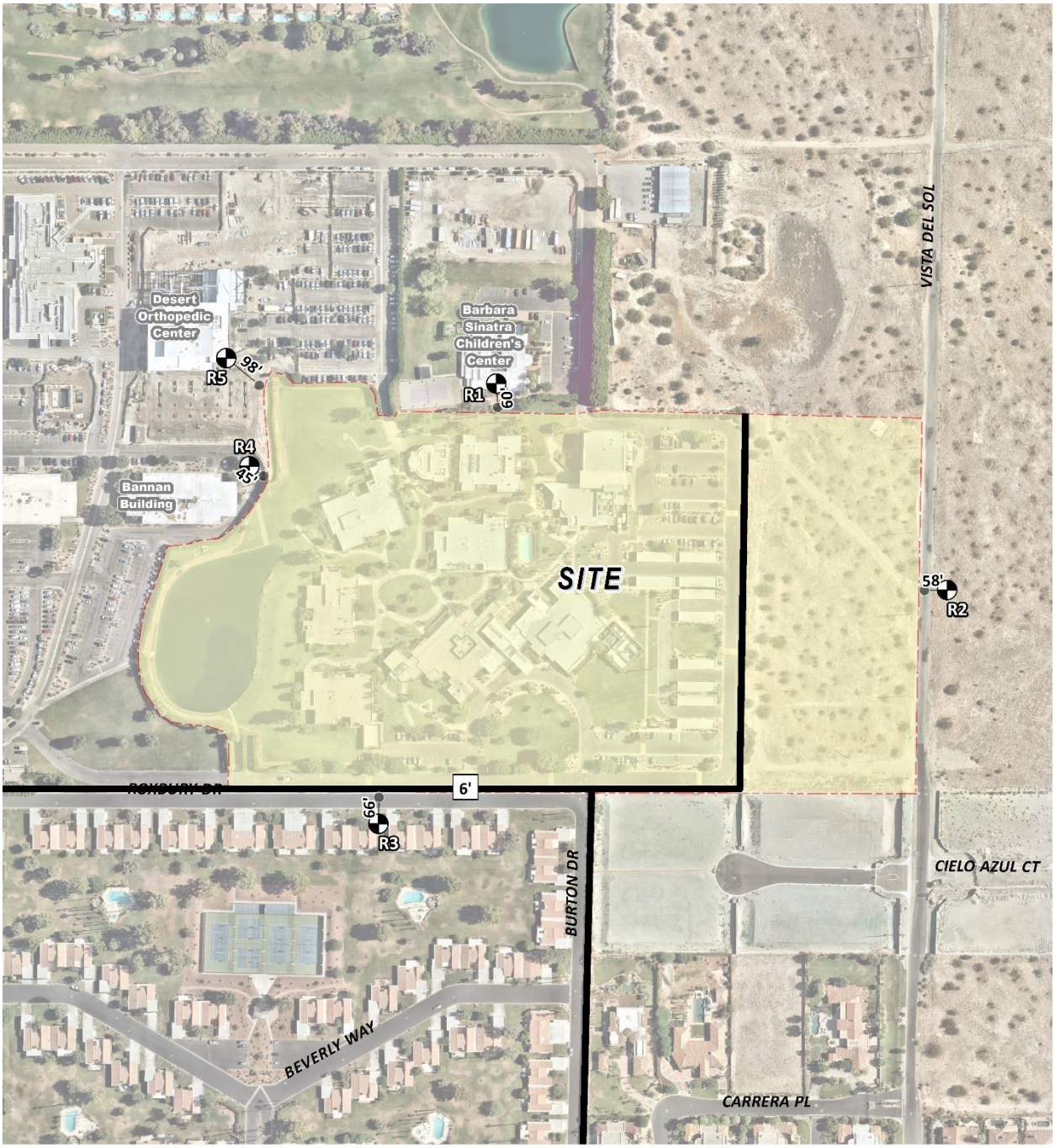
R2: Location R2 represents the vacant land located approximately 58 feet east of the Project site across Vista Del Sol. A 24-hour noise measurement near this location, L2, is used to describe the existing ambient noise environment.

R3: Location R3 represents the existing homes within Wilshire Palms gated community located roughly 66 feet south of the Project site across Roxbury Drive.

R4: Location R4 represents the Bannan building at approximately 45 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 Desert Orthopedic building at approximately 98 feet from the Project site. A 24-hour noise measurement near this location, L5, is used to describe the existing ambient noise environment.

EXHIBIT 8-A: RECEIVER LOCATIONS



9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 8, resulting from the operation of the proposed Hazelden Betty Ford Center Project. Exhibit 9-A identifies the noise source locations used to assess the operational noise levels.

9.1 OPERATIONAL NOISE SOURCES

It is expected the on-site Project-related noise sources will include: air conditioning units, parking lot activity and outdoor courtyard activity. This noise analysis is intended to describe noise level impacts associated with the typical operational activities at the Project site.

9.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 9-1 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 air conditioning units, parking lot activity and outdoor courtyard activity all operating at the same time. These noise level impacts will likely vary throughout the day.

9.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using Larson Davis Lxt Type 1 and Piccolo Type 2 integrating sound level meters and dataloggers. All sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 200, was programmed in "slow" mode to record noise levels in "A" weighted form and was located at approximately five feet above the ground elevation for each measurement. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (17)

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE AND RECEIVER LOCATIONS

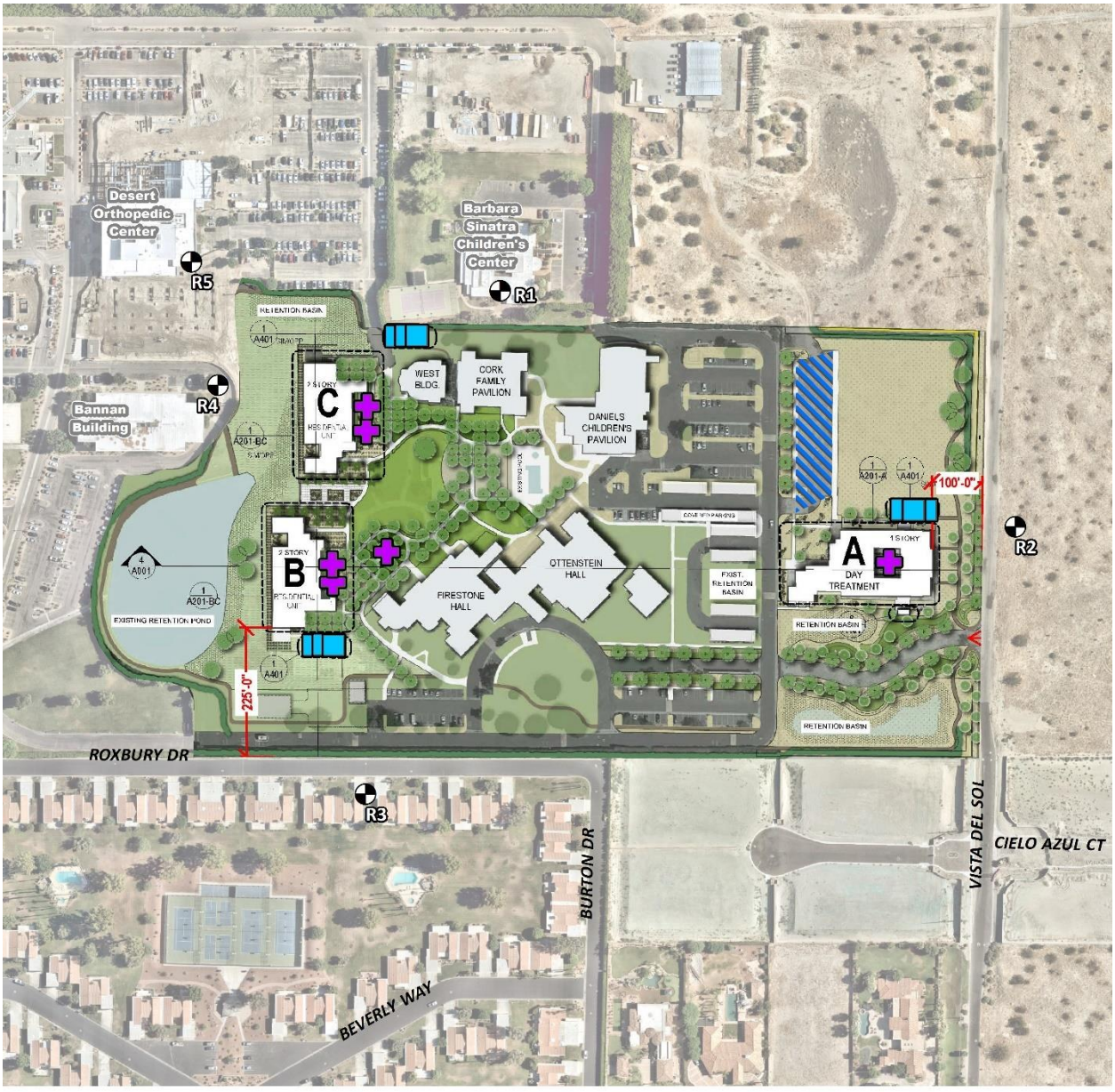


TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Ref. Distance (Feet)	Noise Source Height (Feet)	Min./Hour[4]			Reference Noise Level (dBA L_{eq})		Sound Power Level (dBA)[5]
				Day	Eve.	Night	@ Ref. Dist.	@ 50 Feet	
Air Conditioning Units[1]	96:00:00	5'	5'	39	39	28	77.2	57.2	88.9
Parking Lot Activity[2]	00:23:00	10'	4'	60	60	0	57.9	47.4	88.6
Courtyard Activity[3]	00:08:00	10'	5'	60	60	0	73.8	59.8	91.5

[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 5/17/2017 at the Panasonic Avionics Corporation parking lot in the City of Lake Forest.
[3] As measured by Urban Crossroads, Inc. on 9/21/2019 on the Patio at Louie's by the Bay in the City of Newport Beach.
[4] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Day" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Night" = 10:00 p.m. to 7:00 a.m.
[5] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calculated using the CadnaA noise model at the reference distance to the noise source. Numbers may vary due to size differences between point and area noise sources.

9.2.2 AIR CONDITIONING UNITS

To assess the impacts created by the roof-top air conditioning units at the Project buildings, reference noise levels measurements were taken over a four-day total duration at the Santee Walmart. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe mechanical roof-top air conditioning units on the roof of an existing Walmart store, with additional roof-top units operating in the background. The reference noise level represents Lennox SCA120 series 10-ton model packaged air conditioning units. At 5 feet from the closest roof-top air conditioning unit, the highest exterior noise level from all four days of the measurement period was measured at 77.2 dBA L_{eq}. Using the uniform reference distance of 50 feet, the noise level is 57.2 dBA L_{eq}. The operating conditions of the reference noise level measurement reflect peak summer cooling requirements. The air conditioning units were observed to operate 39 minutes during the daytime and evening hours and 28 minutes per hour during the nighttime hours.

9.2.3 PARKING LOT ACTIVITY

To determine the noise levels associated with parking lot activity, Urban Crossroads collected reference noise level measurements over a 24-hour period at the parking lot for the Panasonic Avionics Corporation in the City of Lake Forest. The peak hour of activity measured over the 24-hour noise level measurement period occurred between 12:00 p.m. to 1:00 p.m., or the typical lunch hour for employees working in the area. The measured reference noise level at 50 feet from parking lot vehicle movements was measured at 47.4 dBA L_{eq}. The parking lot noise levels are mainly due to cars pulling in and out of spaces during peak lunch hour activity and employees talking. Noise associated with parking lot activities are expected to operate during the daytime and evening for the entire hour (60 minutes).

9.2.4 COURTYARD ACTIVITY

To describe the outdoor common area courtyards activity areas, a reference noise level measurement was taken at the Louie's by the Bay in Newport Beach on September 21, 2019. At 50 feet, the reference noise level is 59.8 dBA L_{eq} at a noise source height of 5 feet. The reference noise level measurement includes outdoor eating, drinking, with patrons laughing and talking. Courtyard activities are limited to the daytime and evening hours.

9.3 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze the noise level of multiple types of noise sources and calculates the noise levels at any location using the spatially accurate Project site plan and includes the effects of topography, buildings, and multiple barriers in its calculations using the latest standards to predict outdoor noise impacts. Appendix 9.1 includes the detailed noise model inputs used to estimate the Project operational noise levels presented in this section. Using the spatially accurate Project site plan and flown aerial imagery from Nearmap, a CadnaA noise prediction model of the Project study area was developed. The noise model provides a three-dimensional representation of the Project study area using the following key data inputs:

- Ground absorption;
- Multiple reflections at buildings and barriers;
- Reference noise level sources by type (area, point, etc.) and noise source height;
- Multiple noise receiver locations and heights;
- Topography and earthen berms;
- Barrier and building heights.

Using the ISO 9613 protocol, the CadnaA noise prediction model will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level calculations at each receiver location and the partial noise level contributions by noise source. The reference sound power level (PWL) for the highest noise source expected at the Project site was input into the CadnaA noise prediction model. While sound pressure levels (e.g. L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (PWL) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish as a result of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment. The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. Hard site conditions are used in the operational noise analysis which result in noise levels that attenuate (or decrease) at a rate of 6.0 dBA for each doubling of distance from a point source, based on existing conditions in the Project study area.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. Tables 9-2 shows the calculated Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m., evening hours of 7:00 p.m. to 10:00 p.m. and the nighttime hours of 10:00 p.m. to 7:00 a.m. Table 9-2 shows that the Project operational noise levels will range from 31.4 to 49.8 dBA L_{eq}.

TABLE 9-2: PROJECT OPERATIONAL NOISE LEVELS

Receiver Location[1]	Project Operational Noise Levels (dBA Leq)[2]			Noise Level Standards (dBA Leq)[3]			Threshold Exceeded?[4]		
	Day	Eve.	Night	Day	Eve.	Night	Day	Eve.	Night
R1	49.8	49.8	41.3	55	50	45	No	No	No
R2	48.6	48.6	43.1	55	50	45	No	No	No
R3	44.2	44.2	34.8	55	50	45	No	No	No
R4	40.6	40.6	34.1	55	50	45	No	No	No
R5	39.2	39.2	35.5	55	50	45	No	No	No

[1] See Exhibit 8-A for the noise source and receiver locations.
[2] Proposed Project operational noise level calculations included in Appendix 9.1.
[3] City of Rancho Mirage exterior noise level standards for residential land use, as shown on Table 3-1.
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
"Day" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Night" = 10:00 p.m. to 7:00 a.m.

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the City of Rancho Mirage exterior noise level standards at nearby noise-sensitive receiver locations. Table 9-2 shows that the operational noise levels associated with Hazelden Betty Ford Center Project will satisfy the City of Rancho Mirage 55 dBA L_{eq} daytime, 50 dBA L_{eq} evening and 45 dBA L_{eq} nighttime exterior noise level standards at all nearby receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations.

9.5 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, evening and nighttime ambient conditions are presented on Tables 9-3, 9-4 and 9-5, respectively. As indicated on Tables 9-3, 9-4 and 9-5, the Project will generate an unmitigated operational noise level increases ranging from 0.0 to 4.4 dBA L_{eq} at the nearby receiver locations.

Tables 9-3, 9-4 and 9-5 show that the Project operational noise level contributions satisfy the operational noise level increase significance criteria presented in Table 4-1. Therefore, the Project related operational noise level increases at all sensitive receiver locations will be *less than significant.*

TABLE 9-3: DAYTIME PROJECT OPERATIONAL NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?[7]
R1	49.8	L1	51.5	53.7	2.2	5.0	No
R2	48.6	L2	51.0	53.0	2.0	5.0	No
R3	44.2	L3	56.2	56.5	0.3	5.0	No
R4	40.6	L4	56.3	56.4	0.1	5.0	No
R5	39.2	L5	61.6	61.6	0.0	3.0	No

[1] See Exhibit 8-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

TABLE 9-4: EVENING OPERATIONAL NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?[7]
R1	49.8	L1	49.7	52.8	3.1	5.0	No
R2	48.6	L2	49.0	51.8	2.8	5.0	No
R3	44.2	L3	52.4	53.0	0.6	5.0	No
R4	40.6	L4	52.4	52.7	0.3	5.0	No
R5	39.2	L5	52.2	52.4	0.2	5.0	No

[1] See Exhibit 8-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed evening ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

TABLE 9-5: NIGHTTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?[7]
R1	49.8	L1	47.4	51.8	4.4	5.0	No
R2	48.6	L2	48.9	51.8	2.9	5.0	No
R3	44.2	L3	49.9	50.9	1.0	5.0	No
R4	40.6	L4	51.5	51.8	0.3	5.0	No
R5	39.2	L5	56.2	56.3	0.1	5.0	No

[1] See Exhibit 8-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed night ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

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10 CONSTRUCTION ANALYSIS

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

10.1 CONSTRUCTION NOISE LEVELS

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

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

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to 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.

10.2 CONSTRUCTION REFERENCE NOISE LEVELS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. To assess the worst-case construction noise levels, the Project construction noise analysis relies on the highest noise level impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of construction activity area for each stage of construction to the nearest receiver location. Appendix 10.1 includes the detailed CadnaA construction noise model inputs.

EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS

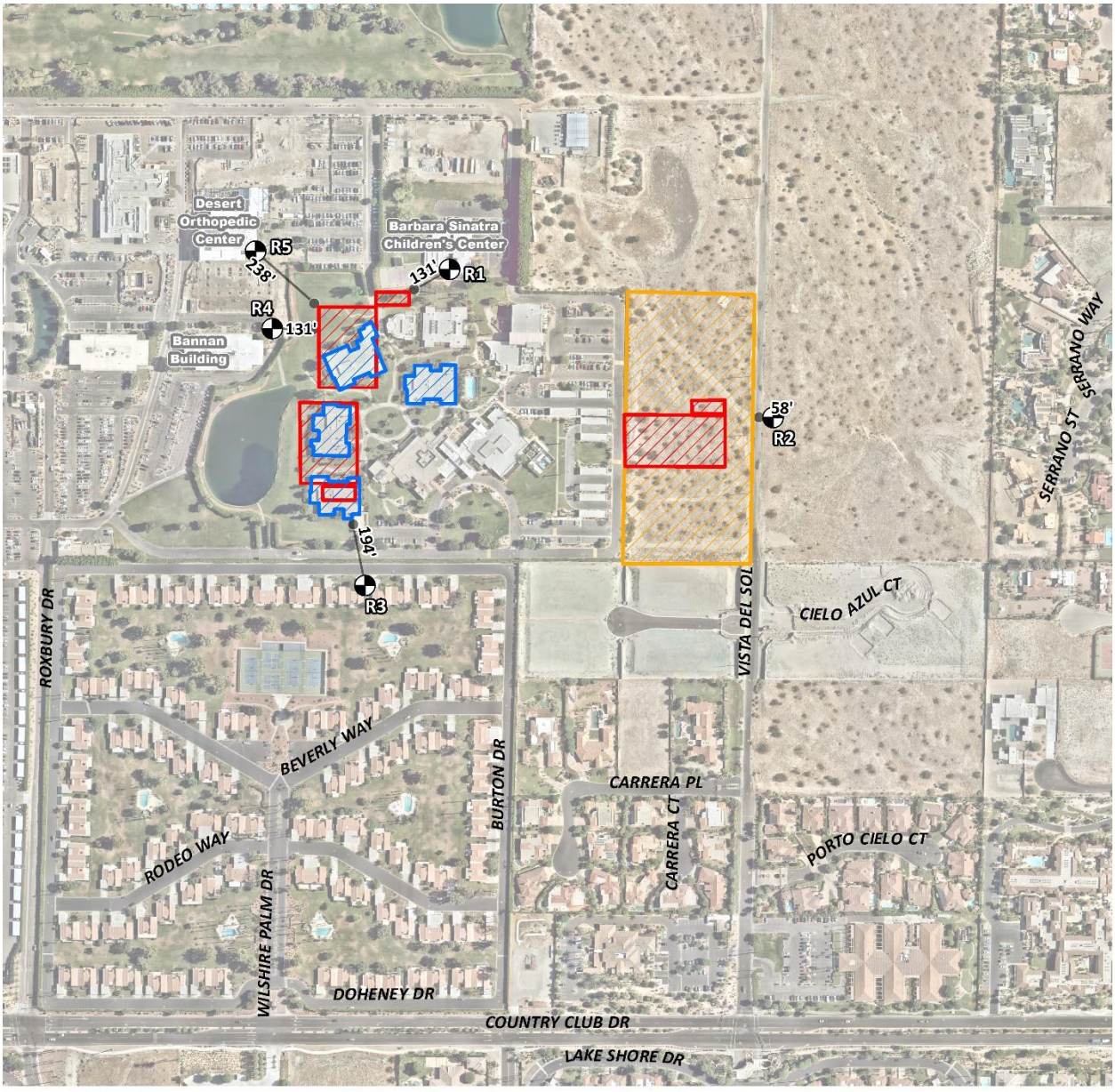

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Highest Reference Noise Level (dBA L_{eq})
Demolition	Demolition Activity	67.9	71.9
	Backhoe	64.2	
	Water Truck Pass-By & Backup Alarm	71.9	
Site Preparation	Scraper, Water Truck, & Dozer Activity	75.3	75.3
	Backhoe	64.2	
	Water Truck Pass-By & Backup Alarm	71.9	
Grading	Rough Grading Activities	73.5	73.5
	Water Truck Pass-By & Backup Alarm	71.9	
	Construction Vehicle Maintenance Activities	67.5	
Building Construction	Foundation Trenching	68.2	71.6
	Framing	62.3	
	Concrete Mixer Backup Alarms & Air Brakes	71.6	
Paving	Concrete Mixer Truck Movements	71.2	71.2
	Concrete Paver Activities	65.6	
	Concrete Mixer Pour & Paving Activities	65.9	
Architectural Coating	Air Compressors	65.2	65.2
	Generator	64.9	
	Crane	62.3	

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

10.3 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 the edge of the construction activity areas to each of the nearby receiver locations. As shown on Table 10-2, the unmitigated construction noise levels are expected to range from 52.1 to 74.6 dBA L_{eq} at the nearby receiver locations. Project construction noise levels are considered exempt if activities occur within the hours specified in the City of Rancho Mirage Municipal Code Section 15.04.030 of 7:00 a.m. to 7:00 p.m. on weekdays.

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

TABLE 10-2: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	60.4	65.7	63.9	62.7	61.6	56.3	65.7
R2	52.1	74.6	72.8	63.5	70.5	57.1	74.6
R3	60.5	63.6	61.8	61.4	59.5	55.0	63.6
R4	62.1	62.0	60.2	65.3	57.9	58.9	65.3
R5	58.6	61.2	59.4	61.7	57.1	55.3	61.7

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Construction noise level calculations based on distance from the construction noise source activity to nearby receiver locations. CadnaA construction noise model inputs are included in Appendix 10.1.

10.4 CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. 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, 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 during various stages of construction. Using the vibration source level of construction equipment provided on Table 6-5 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts.

Table 10-4 shows the highest construction vibration levels are estimated to range from 61.7 to 76.0 VdB at nearby sensitive receiver locations. Based on the vibration standards used in this report, the unmitigated Project construction vibration levels will satisfy the 80 VdB residential vibration thresholds identified by the FTA at all the nearby sensitive receiver locations. Therefore, the vibration impacts due to Project construction are considered *less than significant*. Further, vibration levels 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 simultaneously adjacent to the Project site perimeter.

TABLE 10-4: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)[2]	Receiver Vibration Levels (VdB)[3]					Threshold (VdB)[4]	Threshold Exceeded?[5]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Highest Vibration Levels		
R1	131'	36.4	57.4	64.4	65.4	65.4	80	No
R2	58'	47.0	68.0	75.0	76.0	76.0	80	No
R3	194'	31.3	52.3	59.3	60.3	60.3	80	No
R4	131'	36.4	57.4	64.4	65.4	65.4	80	No
R5	238'	28.6	49.6	56.6	57.6	57.6	80	No

[1] Receiver locations are shown on Exhibit 10-A.
[2] Distance from receiver locations to the source of the nearest construction activity.
[3] Based on the Vibration Source Levels of Construction Equipment included on Table 6-5.
[4] Does the peak vibration exceed the vibration thresholds?
[5] Does the vibration level exceed the FTA acceptable vibration level?

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11 REFERENCES

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9. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* September 2018.
10. **Office of Planning and Research.** *State of California General Plan Guidelines.* 2018.
11. **City of Rancho Mirage.** *Municipal Code, Chapter 8.45 Noise.*
12. —. *Municipal Code, Sections 15.04.030.*
13. **National Institute for Occupational Safety and Health.** *Criteria for Recommended Standard: Occupational Noise Exposure.* June 1998.
14. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* September 2018.
15. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
16. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
17. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
18. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
19. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.

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12 CERTIFICATION

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

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

EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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

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APPENDIX 3.1:

CITY OF RANCHO MIRAGE MUNICIPAL CODE

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Chapter 8.45 NOISE

8.45.010 Purpose.

The city has established a quality of life and environment in which peace and quiet is highly valued by its residents, visitors and businesses. The existence of excessive noise within the city is a condition which is detrimental to the health, safety, comfort, welfare and quality of life of the citizenry and shall be regulated in the public interest. This chapter has been created to implement the goals and policies of the noise element of the city's general plan and to prohibit undesirable noises in the community. This chapter shall be referred to and cited as the Rancho Mirage noise ordinance. (Ord. 633 § 1(Exh. A), 1995)

8.45.020 Definitions.

Ambient noise level means the all encompassing noise level associated with a given environment, being a composite of sounds from all sources, excluding the alleged offensive noise, at the location and approximate time at which a comparison with the alleged offensive noise is to be made.

Cumulative period means an additive period of time consisting of individual time segments which may be continuous or interrupted.

Decibel (dBA) means a unit of sound level measured on a sound level meter using the A-weighting network.

Emergency means any occurrence or set of circumstances involving actual or imminent physical danger, crisis, trauma or property damage which demands immediate action.

Noise level means the same as sound level the terms are interchangeable.

Person means any individual, association, partnership, corporation, organization, or public agency, including associated officer(s), employee(s) or department(s).

Sound level means the quantity of decibels measured using the frequency weighting of A of a sound level meter.

Sound level meter means an instrument meeting the American National Standards Institute's standard S1.4-1983 or later revision, for Type 1 or Type 2 specifications; or an instrument and the associated recording and analyzing equipment which will provide equivalent data. (Ord. 633 § 1(Exh. A), 1995)

8.45.030 Exterior noise level limits.

No person shall operate or cause to be operated any source of sound or allow the creation of sound or noise on property owned, leased, occupied or otherwise controlled by such person which causes the noise level, as measured on any other property, to exceed:

A. The noise level for the applicable zone specified in Table A-1 for a cumulative period of more than thirty minutes in any hour of the applicable time period.

Table A-1

Land Use/Zone	Time of Day	Noise Level (dBA)
Residential, Low Density (R-E, H-R, R-L-2, R-L-3)	7:00 a.m. to 6:00 p.m.	55
	6:00 p.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
Residential, Medium and High Density, Hospital, Open Space (OS, R-M, R-H, MHP)	7:00 a.m. to 6:00 p.m.	60
	6:00 p.m. to 10:00 p.m.	55

	10:00 p.m. to 7:00 a.m.	50
Commercial Office, Resort Commercial, Mixed Use, Institutional (O, P, Rs-H, M-U)	7:00 a.m. to 6:00 p.m. 6:00 p.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	65 60 55
Commercial Neighborhood, General Commercial, Commercial Recreation, Light Industrial (C-N, C-G, I-L)	7:00 a.m. to 6:00 p.m. 6:00 p.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	70 65 60

B. For cumulative periods of time less than thirty minutes in an hour, all the noise standards in Table A-1 are increased according to Table B-1.

Table B-1

Duration of Sound	dBA Adjustment
15—30 minutes per hour	+ 3
10—15 minutes per hour	+ 5
5—10 minutes per hour	+ 10
1—5 minutes per hour	+ 15
Any period of time less than 1 minute per hour	+ 20

C. If the measured ambient noise level exceeds the dBA limits in Table A-1, the noise limits and their adjustments for the first three categories in Table B-1 shall be increased in five dBA increments as needed to encompass or reflect said ambient noise level. The maximum noise level under the last two categories in Table B-1 shall be increased, if necessary, only to equal the ambient noise level. (Ord. 1015 § 2, 2011; Ord. 633 § 1(Exh. A), 1995)

8.45.040 Noise level measurement.

A. The location selected for measuring exterior noise levels shall be at the point of the property line of the affected property nearest the alleged offending noise source. If possible, the ambient noise shall be measured at the same location along the property line.

B. If the measurement location is on a boundary between two different locations, the noise level limit applicable to the lower noise zone shall apply.

C. Upon receipt of a complaint or a request to investigate, the code compliance officer, equipped with an American National Standards Institute Type 2 or better sound level meter, may investigate the complaint. The investigation shall consist of measurements and the gathering of data to adequately define the noise problem and shall include the following:

1. Type and measurement of noise source;
2. Location of noise source relative to complainant's or affected property;
3. Time period during which noise source is considered to be intrusive;
4. Total duration of noise levels measured;
5. Date(s) and time(s) of noise measurement survey. (Ord. 633 § 1(Exh. A), 1995)

8.45.050 Special provisions and exemptions.

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

A. School bands, school athletic and other activities occurring on a school campus;

B. Outdoor gatherings, dance, shows, entertainment for events authorized through the city's special events process;

C. Activities conducted in public parks and public playgrounds that are dependent upon such facilities for their operation;

D. Any emission of sound for purposes of alerting persons to an emergency or the general emission of sound during performance of emergency work;

E. Construction, alteration, repair, grading or improvement of any building, structure, road or improvement to real property for which a permit has been issued by the city if said construction occurs within the allowable hours set forth in Section 15.04.030(A)(10);

F. The operation of any equipment and machinery at any time within any zone by the city, its employees, or any agent or franchisee of the city in the course of performing maintenance, construction or trash collection. (Ord. 633 § 1(Exh. A), 1995)

8.45.060 Additional prohibition.

It is unlawful and a nuisance for any person to keep, maintain or permit upon any lot or parcel of land within the city under his or her control any animal, including any fowl, which by any sound or cry shall habitually disturb the peace and comfort of any person in the reasonable and comfortable enjoyment of life or property. (Ord. 633 § 1(Exh. A), 1995)

8.45.065 Landscape maintenance.

A. It is unlawful and a public nuisance for any person to permit or perform for-hire landscape and non- emergency exterior hardscape maintenance activities such as, but not limited to, tree trimming, re-seeding, lawn mowing, leaf blowing, dust and debris clearing and any other landscaping or nonemergency exterior hardscape maintenance activities which utilize any motorized saw, sander, drill, grinder, leaf-blower, lawnmower, hedge trimmer, edger, or any other similar tool or device any time on Saturday and Sunday and between the hours of six p.m. and seven a.m. the next day during weekdays, unless otherwise provided in this section.

B. The regular mowing or grooming of golf courses, grass tennis courts, grass croquet courts, and lawn bowling areas shall be exempt from the restrictions set forth in this section. The allowed work hours for mowing or green preparation for golf courses, grass tennis courts, grass croquet courts, and lawn bowling areas shall be between five thirty a.m. and seven p.m., seven days per week and during all seasons of the year.

C. Nothing set forth in this section shall permit any person from engaging in any activities that exceed the exterior noise level limits set forth in Section 8.45.030 or otherwise constitute a public nuisance as set forth in Section 14.60.325 of the Municipal Code. (Ord. 979, § 1, 2009; Ord. 936, § 3, 2006)

8.45.070 Administration.

The noise control program established by this chapter shall be administered by and is the responsibility of the code compliance division as directed by the director of the community development department. (Ord. 633 § 1(Exh. A), 1995)

8.45.080 Violations and enforcement procedures.

Violations of this chapter are declared to be a nuisance and subject to the procedures, remedies and penalties set forth in Title 14. (Ord. 916 §4, 2006; Ord. 633 § 1(Exh. A), 1995)

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APPENDIX 5.1:

STUDY AREA PHOTOS

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JN: 12720 Study Area Photos

L1_N
33, 45' 49.990000", 116, 24' 0.010000"

L1_S
33, 45' 49.990000", 116, 24' 0.010000"

L1_W
33, 45' 49.970000", 116, 23' 59.980000"

L2_E
33, 45' 45.520000", 116, 23' 50.690000"

L2_N
33, 46' 2.170000", 116, 27' 29.730000"

L2_S
33, 45' 45.100000", 116, 23' 51.220000"

JN: 12720 Study Area Photos

L2_W
33, 45' 45.630000", 116, 23' 50.670000"

L3_E
33, 45' 31.750000", 116, 23' 57.530000"

L3_N
33, 45' 32.770000", 116, 24' 15.960000"

L3_S
33, 45' 31.790000", 116, 23' 57.590000"

L3_W
33, 45' 31.720000", 116, 23' 57.590000"

L4_E
33, 45' 46.360000", 116, 24' 10.440000"

JN: 12720 Study Area Photos

L4_N
33, 45' 46.380000", 116, 24' 10.470000"

L4_S
33, 45' 46.380000", 116, 24' 10.440000"

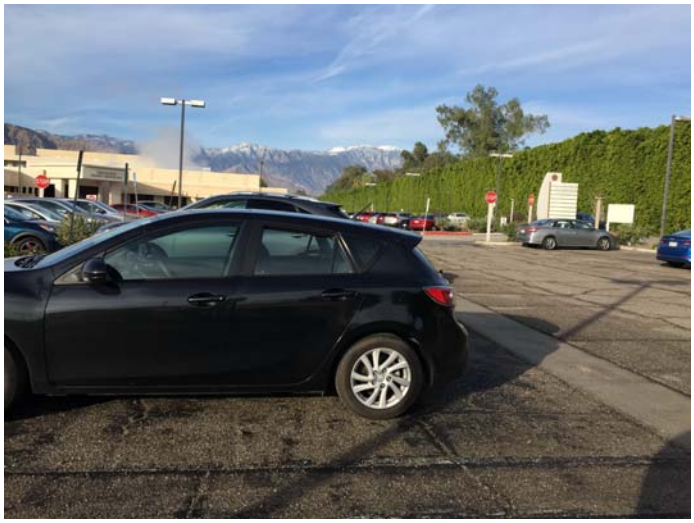
L4_W
33, 45' 46.380000", 116, 24' 10.470000"

L5_E
33, 45' 53.370000", 116, 24' 9.430000"

L5_N
33, 45' 53.430000", 116, 24' 9.430000"

L5_S
33, 45' 53.390000", 116, 24' 9.450000"

JN: 12720 Study Area Photos



L5_W
33, 45' 53.390000", 116, 24' 9.430000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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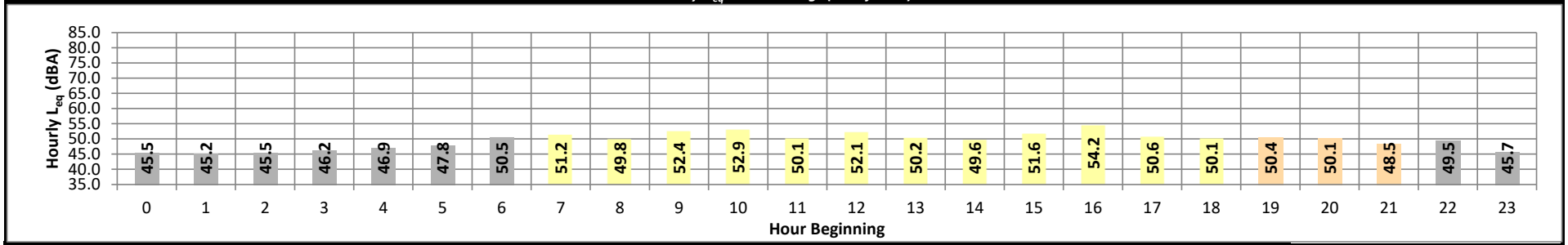
24-Hour Noise Level Measurement Summary

Date: Thursday, December 5, 2019 *Location:* L1 - Located north of the Project site near the Barbara Sinatra Children's center. *Meter:* Piccolo I *JN:* 12720

Project: Hazelden Betty Ford Center *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	45.5	52.2	44.4	47.0	46.0	46.0	46.0	45.0	45.0	44.0	44.0	44.0	45.5	10.0	55.5
	1	45.2	51.2	44.0	47.0	47.0	46.0	46.0	45.0	45.0	44.0	44.0	44.0	45.2	10.0	55.2
	2	45.5	50.4	44.2	47.0	46.0	46.0	46.0	45.0	45.0	44.0	44.0	44.0	45.5	10.0	55.5
	3	46.2	66.0	43.4	51.0	48.0	46.0	45.0	44.0	44.0	43.0	43.0	43.0	46.2	10.0	56.2
	4	46.9	58.2	43.6	52.0	51.0	50.0	49.0	47.0	46.0	44.0	44.0	43.0	46.9	10.0	56.9
	5	47.8	59.1	45.0	52.0	51.0	50.0	50.0	48.0	47.0	45.0	45.0	45.0	47.8	10.0	57.8
	6	50.5	68.0	46.6	57.0	54.0	52.0	51.0	50.0	49.0	48.0	48.0	47.0	50.5	10.0	60.5
Day	7	51.2	68.9	45.9	59.0	56.0	54.0	53.0	51.0	49.0	47.0	47.0	46.0	51.2	0.0	51.2
	8	49.8	70.7	44.4	58.0	56.0	52.0	51.0	49.0	47.0	45.0	45.0	44.0	49.8	0.0	49.8
	9	52.4	72.2	44.4	66.0	61.0	55.0	52.0	48.0	46.0	45.0	44.0	44.0	52.4	0.0	52.4
	10	52.9	69.8	43.3	66.0	63.0	57.0	55.0	49.0	46.0	44.0	44.0	43.0	52.9	0.0	52.9
	11	50.1	70.5	42.4	61.0	58.0	53.0	51.0	47.0	45.0	43.0	43.0	43.0	50.1	0.0	50.1
	12	52.1	72.3	43.5	65.0	61.0	56.0	53.0	47.0	45.0	44.0	43.0	43.0	52.1	0.0	52.1
	13	50.2	68.6	43.6	61.0	58.0	55.0	53.0	47.0	45.0	44.0	44.0	43.0	50.2	0.0	50.2
	14	49.6	67.7	43.6	61.0	57.0	53.0	50.0	47.0	45.0	44.0	44.0	44.0	49.6	0.0	49.6
	15	51.6	70.5	43.6	64.0	61.0	56.0	53.0	48.0	46.0	44.0	44.0	43.0	51.6	0.0	51.6
	16	54.2	73.2	45.0	65.0	62.0	59.0	58.0	53.0	47.0	46.0	45.0	45.0	54.2	0.0	54.2
	17	50.6	70.7	44.6	61.0	57.0	52.0	51.0	48.0	47.0	46.0	45.0	45.0	50.6	0.0	50.6
	18	50.1	69.4	44.3	62.0	56.0	50.0	49.0	47.0	46.0	45.0	44.0	44.0	50.1	0.0	50.1
Evening	19	50.4	70.4	44.4	60.0	56.0	51.0	49.0	47.0	46.0	45.0	44.0	44.0	50.4	5.0	55.4
	20	50.1	67.0	45.2	62.0	60.0	52.0	50.0	47.0	46.0	46.0	45.0	45.0	50.1	5.0	55.1
	21	48.5	69.1	44.9	55.0	50.0	48.0	47.0	46.0	46.0	45.0	45.0	45.0	48.5	5.0	53.5
Night	22	49.5	66.2	44.6	59.0	58.0	56.0	51.0	46.0	46.0	45.0	45.0	44.0	49.5	10.0	59.5
	23	45.7	57.4	44.5	48.0	48.0	47.0	46.0	45.0	45.0	44.0	44.0	44.0	45.7	10.0	55.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	49.6	67.7	42.4	58.0	56.0	50.0	49.0	47.0	45.0	43.0	43.0	43.0
	Max	54.2	73.2	45.9	66.0	63.0	59.0	58.0	53.0	49.0	47.0	47.0	46.0
Energy Average		51.5	Average:		62.4	58.8	54.3	52.4	48.4	46.2	44.8	44.3	43.9
Evening	Min	48.5	67.0	44.4	55.0	50.0	48.0	47.0	46.0	46.0	45.0	44.0	44.0
	Max	50.4	70.4	45.2	62.0	60.0	52.0	50.0	47.0	46.0	46.0	45.0	45.0
Energy Average		49.7	Average:		59.0	55.3	50.3	48.7	46.7	46.0	45.3	44.7	44.7
Night	Min	45.2	50.4	43.4	47.0	46.0	46.0	45.0	44.0	44.0	43.0	43.0	43.0
	Max	50.5	68.0	46.6	59.0	58.0	56.0	51.0	50.0	49.0	48.0	48.0	47.0
Energy Average		47.4	Average:		51.1	49.9	48.8	47.8	46.1	45.8	44.6	44.6	44.2

L_{eq} (dBA)

24-Hour	Daytime	Nighttime
50.1	**51.2**	**47.4**

24-Hour CNEL (dBA)

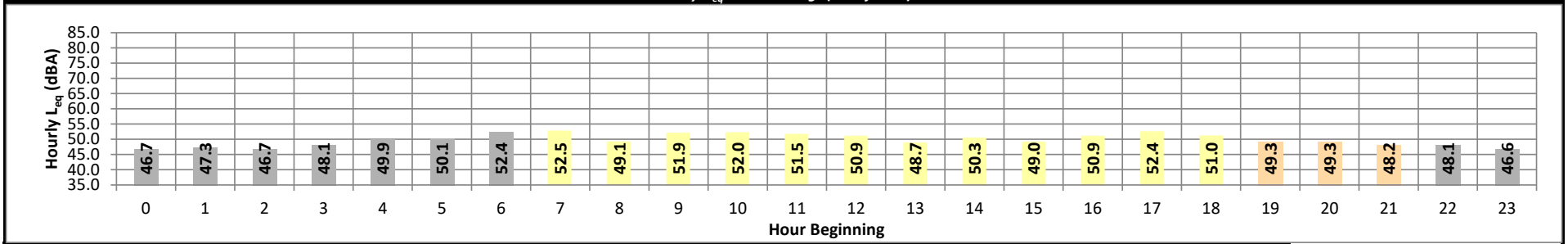
55.0

24-Hour Noise Level Measurement Summary

Date: Thursday, December 5, 2019 *Location:* L2 - Located east of the project site on Vista Del Sol next to vacant wilderness. *Meter:* Piccolo I *JN:* 12720

Project: Hazelden Betty Ford Center *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	46.7	50.5	45.4	48.0	47.0	47.0	47.0	46.0	46.0	46.0	45.0	45.0	46.7	10.0	56.7
	1	47.3	49.8	45.9	49.0	48.0	48.0	48.0	47.0	47.0	46.0	46.0	46.0	47.3	10.0	57.3
	2	46.7	49.3	45.5	48.0	47.0	47.0	47.0	47.0	46.0	46.0	46.0	45.0	46.7	10.0	56.7
	3	48.1	58.8	46.1	51.0	49.0	49.0	49.0	48.0	47.0	46.0	46.0	46.0	48.1	10.0	58.1
	4	49.9	53.6	47.8	51.0	51.0	51.0	50.0	50.0	49.0	48.0	48.0	48.0	49.9	10.0	59.9
	5	50.1	52.9	48.1	51.0	51.0	51.0	51.0	50.0	50.0	49.0	49.0	48.0	50.1	10.0	60.1
	6	52.4	61.8	50.1	54.0	54.0	53.0	53.0	52.0	52.0	51.0	51.0	50.0	52.4	10.0	62.4
Day	7	52.5	61.9	49.8	54.0	54.0	53.0	53.0	53.0	52.0	51.0	50.0	50.0	52.5	0.0	52.5
	8	49.1	73.2	43.2	54.0	51.0	49.0	48.0	47.0	45.0	44.0	44.0	43.0	49.1	0.0	49.1
	9	51.9	70.2	40.9	66.0	63.0	55.0	53.0	46.0	44.0	42.0	42.0	41.0	51.9	0.0	51.9
	10	52.0	72.9	38.0	65.0	64.0	57.0	53.0	44.0	41.0	39.0	39.0	39.0	52.0	0.0	52.0
	11	51.5	78.6	38.8	63.0	58.0	51.0	49.0	43.0	42.0	39.0	39.0	39.0	51.5	0.0	51.5
	12	50.9	70.4	39.3	63.0	61.0	55.0	52.0	45.0	43.0	41.0	41.0	39.0	50.9	0.0	50.9
	13	48.7	67.1	39.3	61.0	58.0	53.0	50.0	45.0	43.0	41.0	41.0	41.0	48.7	0.0	48.7
	14	50.3	71.2	39.5	64.0	60.0	52.0	49.0	45.0	44.0	42.0	41.0	41.0	50.3	0.0	50.3
	15	49.0	68.0	40.7	62.0	58.0	50.0	48.0	45.0	44.0	42.0	41.0	41.0	49.0	0.0	49.0
	16	50.9	69.9	42.5	63.0	60.0	53.0	50.0	46.0	45.0	44.0	44.0	43.0	50.9	0.0	50.9
	17	52.4	71.7	45.0	63.0	58.0	55.0	54.0	51.0	48.0	46.0	46.0	45.0	52.4	0.0	52.4
	18	51.0	72.4	45.2	61.0	55.0	51.0	50.0	48.0	47.0	46.0	46.0	45.0	51.0	0.0	51.0
Evening	19	49.3	67.3	45.3	59.0	54.0	50.0	48.0	47.0	47.0	46.0	45.0	45.0	49.3	5.0	54.3
	20	49.3	62.3	46.6	59.0	55.0	50.0	49.0	48.0	48.0	47.0	47.0	46.0	49.3	5.0	54.3
	21	48.2	62.5	46.5	52.0	49.0	48.0	48.0	48.0	47.0	47.0	47.0	46.0	48.2	5.0	53.2
Night	22	48.1	60.0	45.7	54.0	51.0	49.0	49.0	47.0	47.0	46.0	46.0	46.0	48.1	10.0	58.1
	23	46.6	57.8	45.3	48.0	47.0	47.0	47.0	46.0	46.0	46.0	45.0	45.0	46.6	10.0	56.6

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	48.7	61.9	38.0	54.0	51.0	49.0	48.0	43.0	41.0	39.0	39.0	39.0
	Max	52.5	78.6	49.8	66.0	64.0	57.0	54.0	53.0	52.0	51.0	50.0	50.0
Energy Average		51.0	Average:		61.6	58.3	52.8	50.8	46.5	44.8	43.1	42.8	42.3
Evening	Min	48.2	62.3	45.3	52.0	49.0	48.0	48.0	47.0	47.0	46.0	45.0	45.0
	Max	49.3	67.3	46.6	59.0	55.0	50.0	49.0	48.0	48.0	47.0	47.0	46.0
Energy Average		49.0	Average:		56.7	52.7	49.3	48.3	47.7	47.3	46.7	46.3	45.7
Night	Min	46.6	49.3	45.3	48.0	47.0	47.0	47.0	46.0	46.0	46.0	45.0	45.0
	Max	52.4	61.8	50.1	54.0	54.0	53.0	53.0	52.0	52.0	51.0	51.0	50.0
Energy Average		48.9	Average:		50.4	49.4	49.1	49.0	48.1	47.8	47.1	46.9	46.6

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
50.1	**50.7**	**48.9**

24-Hour CNEL (dBA)

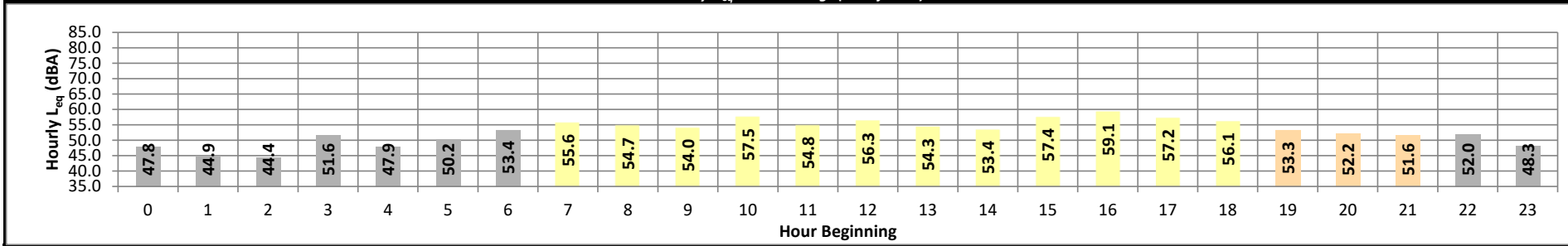
55.8

24-Hour Noise Level Measurement Summary

Date: Thursday, December 5, 2019 *Location:* L3 - Located south of the project site near Oral, Facial and Implant surgery offices. *Meter:* Piccolo II *JN:* 12720

Project: Hazelden Betty Ford Center *Analyst:* P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	47.8	55.8	43.7	55.4	54.8	53.0	51.3	48.3	45.3	44.1	43.9	43.7	47.8	10.0	57.8
	1	44.9	52.6	41.4	52.2	51.6	49.8	48.2	44.7	43.2	41.8	41.6	41.5	44.9	10.0	54.9
	2	44.4	51.9	41.0	51.4	50.9	49.0	47.5	44.1	42.8	41.4	41.2	41.1	44.4	10.0	54.4
	3	51.6	63.0	44.2	62.4	61.3	58.1	55.6	49.7	47.5	45.2	44.7	44.3	51.6	10.0	61.6
	4	47.9	56.9	43.8	56.2	55.2	53.2	51.6	47.5	45.8	44.2	44.0	43.9	47.9	10.0	57.9
	5	50.2	58.7	45.3	58.2	57.5	55.6	54.0	50.3	47.9	45.7	45.5	45.3	50.2	10.0	60.2
	6	53.4	59.4	48.9	59.1	58.6	57.5	56.8	54.3	52.0	49.5	49.2	48.9	53.4	10.0	63.4
Day	7	55.6	64.0	49.2	63.5	62.7	60.5	59.3	56.1	53.9	50.4	49.8	49.3	55.6	0.0	55.6
	8	54.7	61.2	49.1	60.8	60.3	59.3	58.5	55.6	53.2	50.1	49.7	49.3	54.7	0.0	54.7
	9	54.0	59.9	48.4	59.6	59.1	58.1	57.4	55.1	52.7	49.4	49.0	48.6	54.0	0.0	54.0
	10	57.5	64.4	48.3	63.9	63.5	62.7	62.0	59.0	54.3	49.7	49.1	48.5	57.5	0.0	57.5
	11	54.8	62.2	48.6	61.6	60.8	59.5	58.6	55.7	53.0	49.7	49.2	48.8	54.8	0.0	54.8
	12	56.3	63.6	48.3	63.0	62.5	61.7	61.0	57.5	53.3	49.5	49.0	48.4	56.3	0.0	56.3
	13	54.3	61.9	47.9	61.4	60.6	59.0	58.1	55.0	52.7	49.1	48.5	48.0	54.3	0.0	54.3
	14	53.4	59.2	47.8	58.9	58.4	57.3	56.4	54.2	52.5	49.3	48.5	48.0	53.4	0.0	53.4
	15	57.4	63.8	49.0	63.5	63.1	62.4	62.0	58.8	55.3	50.5	49.8	49.2	57.4	0.0	57.4
	16	59.1	65.3	50.7	64.8	64.4	63.5	62.9	60.9	57.8	52.3	51.6	50.8	59.1	0.0	59.1
	17	57.2	64.2	49.4	63.8	63.5	62.4	61.4	58.1	55.2	50.5	49.9	49.5	57.2	0.0	57.2
	18	56.1	63.1	49.1	62.9	62.5	61.5	60.8	57.1	53.2	49.9	49.5	49.2	56.1	0.0	56.1
Evening	19	53.3	62.4	46.7	62.0	61.1	59.6	57.4	53.1	50.6	47.6	47.1	46.8	53.3	5.0	58.3
	20	52.2	60.1	46.3	59.7	59.1	57.5	56.2	52.9	49.8	47.1	46.7	46.4	52.2	5.0	57.2
	21	51.6	58.8	45.7	58.4	57.8	56.4	55.7	52.8	49.1	46.4	46.1	45.8	51.6	5.0	56.6
Night	22	52.0	61.0	45.7	60.4	59.6	57.7	56.4	52.0	49.4	46.3	46.0	45.8	52.0	10.0	62.0
	23	48.3	56.1	44.4	55.6	55.0	53.2	51.9	48.3	46.4	44.9	44.7	44.5	48.3	10.0	58.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	53.4	59.2	47.8	58.9	58.4	57.3	56.4	54.2	52.5	49.1	48.5	48.0
	Max	59.1	65.3	50.7	64.8	64.4	63.5	62.9	60.9	57.8	52.3	51.6	50.8
Energy Average		56.2	Average:		62.3	61.8	60.7	59.8	56.9	53.9	50.0	49.5	49.0
Evening	Min	51.6	58.8	45.7	58.4	57.8	56.4	55.7	52.8	49.1	46.4	46.1	45.8
	Max	53.3	62.4	46.7	62.0	61.1	59.6	57.4	53.1	50.6	47.6	47.1	46.8
Energy Average		52.4	Average:		60.0	59.3	57.8	56.4	53.0	49.8	47.0	46.6	46.3
Night	Min	44.4	51.9	41.0	51.4	50.9	49.0	47.5	44.1	42.8	41.4	41.2	41.1
	Max	53.4	63.0	48.9	62.4	61.3	58.1	56.8	54.3	52.0	49.5	49.2	48.9
Energy Average		49.9	Average:		56.8	56.0	54.1	52.6	48.8	46.7	44.8	44.5	44.3

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
54.3	**55.7**	**49.9**

24-Hour CNEL (dBA)

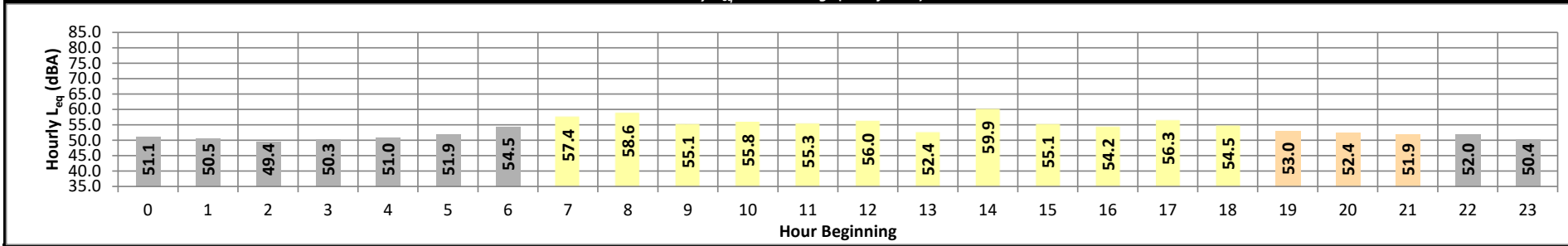
58.1

24-Hour Noise Level Measurement Summary

Date: Thursday, December 5, 2019 *Location:* L4 - Located near the western boundary of the Project site by the Bannan Building. *Meter:* Piccolo II *JN:* 12720

Project: Hazelden Betty Ford Center *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	51.1	55.9	49.0	55.4	55.1	54.4	53.5	51.5	50.3	49.4	49.3	49.1	51.1	10.0	61.1
	1	50.5	54.7	48.7	54.5	54.2	53.3	52.5	50.6	49.9	49.1	49.0	48.8	50.5	10.0	60.5
	2	49.4	50.9	48.5	50.8	50.7	50.5	50.3	49.6	49.3	48.8	48.7	48.6	49.4	10.0	59.4
	3	50.3	54.6	48.1	54.3	54.0	53.5	53.1	50.8	49.3	48.5	48.4	48.2	50.3	10.0	60.3
	4	51.0	55.1	49.0	54.9	54.7	54.1	53.5	51.1	50.2	49.4	49.3	49.1	51.0	10.0	61.0
	5	51.9	56.1	49.8	55.9	55.6	54.9	54.2	52.3	51.3	50.3	50.1	49.9	51.9	10.0	61.9
	6	54.5	58.6	52.6	58.2	57.9	57.1	56.5	54.8	53.9	53.0	52.8	52.6	54.5	10.0	64.5
Day	7	57.4	62.8	53.5	62.3	61.8	61.0	60.4	58.3	56.4	54.2	54.0	53.7	57.4	0.0	57.4
	8	58.6	75.3	54.1	74.1	73.3	70.2	68.0	63.7	61.3	56.6	55.7	54.6	58.6	0.0	58.6
	9	55.1	64.9	47.4	63.6	62.3	59.7	58.4	56.1	52.8	48.6	48.0	47.5	55.1	0.0	55.1
	10	55.8	63.5	47.0	63.0	62.5	61.3	60.6	57.1	52.2	48.0	47.5	47.2	55.8	0.0	55.8
	11	55.3	68.0	46.7	66.2	64.3	60.2	58.6	54.8	51.6	49.0	48.6	46.9	55.3	0.0	55.3
	12	56.0	65.2	50.3	64.5	63.4	60.3	59.8	56.5	52.8	50.8	50.6	50.3	56.0	0.0	56.0
	13	52.4	61.3	46.2	60.4	59.4	57.7	56.6	53.4	49.7	47.0	46.6	46.3	52.4	0.0	52.4
	14	59.9	70.7	53.4	69.6	68.5	66.0	63.9	58.2	57.5	54.0	53.8	53.6	59.9	0.0	59.9
	15	55.1	63.8	47.5	63.0	62.2	60.4	59.2	55.7	52.8	48.5	48.1	47.7	55.1	0.0	55.1
	16	54.2	61.4	48.3	61.0	60.5	59.1	58.3	55.8	51.8	49.0	48.7	48.5	54.2	0.0	54.2
	17	56.3	64.4	50.8	64.0	63.6	62.0	60.7	56.5	53.6	51.7	51.2	50.9	56.3	0.0	56.3
	18	54.5	60.1	51.0	59.8	59.5	58.9	58.6	55.1	52.4	51.4	51.2	51.1	54.5	0.0	54.5
Evening	19	53.0	58.3	50.1	57.9	57.6	56.8	56.0	54.0	51.5	50.5	50.4	50.2	53.0	5.0	58.0
	20	52.4	56.9	50.5	56.4	55.9	55.2	54.5	52.8	51.7	50.8	50.6	50.5	52.4	5.0	57.4
	21	51.9	56.4	49.6	56.2	56.1	55.7	55.2	52.0	50.6	49.9	49.8	49.7	51.9	5.0	56.9
Night	22	52.0	56.1	49.6	55.9	55.6	55.2	54.6	52.6	50.9	50.0	49.9	49.7	52.0	10.0	62.0
	23	50.4	53.7	49.0	53.4	53.0	52.4	51.9	50.7	50.1	49.3	49.2	49.1	50.4	10.0	60.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	52.4	60.1	46.2	59.8	59.4	57.7	56.6	53.4	49.7	47.0	46.6	46.3
	Max	59.9	75.3	54.1	74.1	73.3	70.2	68.0	63.7	61.3	56.6	55.7	54.6
Energy Average		56.3	Average:		64.3	63.4	61.4	60.2	56.8	53.7	50.7	50.3	49.8
Evening	Min	51.9	56.4	49.6	56.2	55.9	55.2	54.5	52.0	50.6	49.9	49.8	49.7
	Max	53.0	58.3	50.5	57.9	57.6	56.8	56.0	54.0	51.7	50.8	50.6	50.5
Energy Average		52.4	Average:		56.8	56.5	55.9	55.2	53.0	51.3	50.4	50.3	50.1
Night	Min	49.4	50.9	48.1	50.8	50.7	50.5	50.3	49.6	49.3	48.5	48.4	48.2
	Max	54.5	58.6	52.6	58.2	57.9	57.1	56.5	54.8	53.9	53.0	52.8	52.6
Energy Average		51.5	Average:		54.8	54.5	53.9	53.4	51.6	50.6	49.8	49.6	49.5

L_{eq} (dBA)

24-Hour	Daytime	Nighttime
54.6	**55.8**	**51.5**

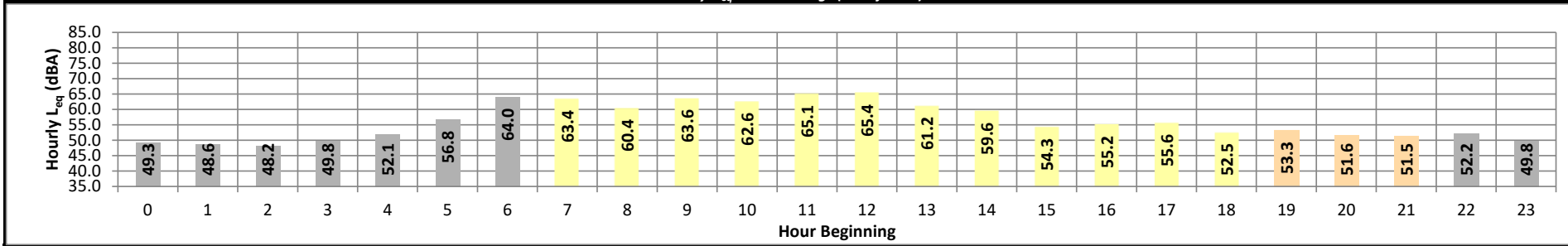
24-Hour CNEL (dBA)

59.1

24-Hour Noise Level Measurement Summary

Date: Thursday, December 5, 2019
Project: Hazelden Betty Ford Center
Location: L5 - Located northwest of Project site near Hal B. Wallis Building Cardiology.
Meter: Piccolo II
JN: 12720
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	49.3	52.1	48.0	51.8	51.5	51.0	50.5	49.6	49.0	48.3	48.2	48.1	49.3	10.0	59.3
	1	48.6	50.4	47.5	50.2	50.0	49.7	49.5	48.9	48.4	47.9	47.7	47.6	48.6	10.0	58.6
	2	48.2	49.7	47.3	49.5	49.4	49.1	48.9	48.5	48.1	47.7	47.6	47.4	48.2	10.0	58.2
	3	49.8	55.4	46.9	55.1	54.5	53.3	52.7	50.5	48.5	47.3	47.2	47.0	49.8	10.0	59.8
	4	52.1	56.2	49.5	56.1	55.8	55.3	54.8	52.4	51.3	50.1	49.8	49.6	52.1	10.0	62.1
	5	56.8	64.4	51.2	64.0	63.7	62.6	61.0	56.8	54.8	52.1	51.7	51.3	56.8	10.0	66.8
	6	64.0	70.0	56.8	69.4	68.9	68.0	67.5	65.2	62.4	59.7	58.9	57.2	64.0	10.0	74.0
Day	7	63.4	70.3	56.1	69.7	69.0	67.8	67.0	64.4	62.1	58.3	57.4	56.4	63.4	0.0	63.4
	8	60.4	70.6	51.9	69.6	68.3	65.1	63.8	60.9	58.1	54.0	53.1	52.2	60.4	0.0	60.4
	9	63.6	71.9	57.5	71.0	69.9	67.5	66.6	64.4	62.3	58.7	58.2	57.6	63.6	0.0	63.6
	10	62.6	71.1	55.1	70.3	69.7	67.3	66.1	63.3	60.4	56.6	56.0	55.3	62.6	0.0	62.6
	11	65.1	72.3	59.5	71.8	71.1	69.8	69.1	65.3	63.6	60.9	60.4	59.8	65.1	0.0	65.1
	12	65.4	74.5	60.3	73.4	72.1	69.8	68.7	65.5	63.8	61.4	60.9	60.5	65.4	0.0	65.4
	13	61.2	68.8	54.6	68.2	67.4	65.6	64.6	61.9	59.7	56.1	55.5	54.8	61.2	0.0	61.2
	14	59.6	67.0	51.1	66.5	66.0	64.7	63.7	60.3	57.5	52.4	51.8	51.3	59.6	0.0	59.6
	15	54.3	63.5	44.4	62.7	62.0	60.2	58.3	55.1	51.5	46.3	45.8	44.8	54.3	0.0	54.3
	16	55.2	62.4	51.5	62.1	61.4	59.7	58.4	55.5	53.5	52.0	51.8	51.5	55.2	0.0	55.2
	17	55.6	61.8	50.8	61.5	61.1	60.1	59.5	56.4	53.9	51.6	51.3	50.9	55.6	0.0	55.6
	18	52.5	57.5	48.9	57.2	57.0	56.5	56.0	53.5	50.8	49.4	49.2	49.0	52.5	0.0	52.5
Evening	19	53.3	58.9	49.3	58.6	58.5	57.7	57.1	54.4	51.2	49.7	49.5	49.4	53.3	5.0	58.3
	20	51.6	54.9	49.6	54.7	54.5	54.0	53.6	52.4	50.9	50.0	49.8	49.7	51.6	5.0	56.6
	21	51.5	57.7	48.2	57.3	57.0	56.1	55.4	51.4	49.6	48.6	48.5	48.3	51.5	5.0	56.5
Night	22	52.2	57.5	48.8	57.3	57.1	56.5	55.8	53.0	50.2	49.2	49.0	48.8	52.2	10.0	62.2
	23	49.8	53.8	48.0	53.5	53.1	52.3	51.5	50.2	49.2	48.4	48.3	48.1	49.8	10.0	59.8

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	52.5	57.5	44.4	57.2	57.0	56.5	56.0	53.5	50.8	46.3	45.8	44.8
	Max	65.4	74.5	60.3	73.4	72.1	69.8	69.1	65.5	63.8	61.4	60.9	60.5
Energy Average		61.6	Average:		67.0	66.2	64.5	63.5	60.6	58.1	54.8	54.3	53.7
Evening	Min	51.5	54.9	48.2	54.7	54.5	54.0	53.6	51.4	49.6	48.6	48.5	48.3
	Max	53.3	58.9	49.6	58.6	58.5	57.7	57.1	54.4	51.2	50.0	49.8	49.7
Energy Average		52.2	Average:		56.9	56.6	55.9	55.4	52.7	50.6	49.5	49.3	49.1
Night	Min	48.2	49.7	46.9	49.5	49.4	49.1	48.9	48.5	48.1	47.3	47.2	47.0
	Max	64.0	70.0	56.8	69.4	68.9	68.0	67.5	65.2	62.4	59.7	58.9	57.2
Energy Average		56.2	Average:		56.3	56.0	55.3	54.7	52.8	51.3	50.1	49.8	49.5

L_{eq} (dBA)

24-Hour	Daytime	Nighttime
59.6	60.8	56.2

24-Hour CNEL (dBA)

63.7

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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: Hazelden Betty Ford Cent
Road Name: Bob Hope Dr. | Job Number: 12720
Road Segment: n/o MacMillan Wy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,723 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,988 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.03	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.21	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.16	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.6	67.4	66.0	60.0	68.4	69.1
Medium Trucks:	62.4	59.2	51.7	60.5	66.7	66.7
Heavy Trucks:	63.2	59.9	56.5	61.2	67.4	67.5
Vehicle Noise:	70.4	68.6	66.6	65.4	72.3	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	79	169	365	787
CNEL:	82	178	383	825

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Hazelden Betty Ford Cent
Road Name: Bob Hope Dr. | Job Number: 12720
Road Segment: s/o Street A

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,193 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,608 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.11	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-17.13	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.08	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.7	66.4	65.1	59.1	67.5	68.2
Medium Trucks:	61.4	58.3	50.8	59.6	65.7	65.8
Heavy Trucks:	62.3	59.0	55.6	60.3	66.5	66.6
Vehicle Noise:	69.5	67.7	65.7	64.4	71.4	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	68	147	317	683
CNEL:	72	154	332	716

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Hazelden Betty Ford Cent
Road Name: Bob Hope Dr. | Job Number: 12720
Road Segment: s/o Country Club Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,765 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,656 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.24	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-17.00	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.95	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	66.6	65.2	59.2	67.7	68.3
Medium Trucks:	61.6	58.4	50.9	59.7	65.9	65.9
Heavy Trucks:	62.4	59.1	55.8	60.4	66.6	66.7
Vehicle Noise:	69.6	67.8	65.9	64.6	71.5	71.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	70	150	323	697
CNEL:	73	157	339	730

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Hazelden Betty Ford Cent
Road Name: John L. Sinn Rd. | Job Number: 12720
Road Segment: s/o Street A

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,755 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	315 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.42	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.66	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.61	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.4	55.1	53.8	47.8	56.2	56.9
Medium Trucks:	51.3	48.1	40.6	49.4	55.6	55.6
Heavy Trucks:	54.5	51.2	47.8	52.5	58.7	58.8
Vehicle Noise:	59.3	57.2	55.0	55.1	61.8	62.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	18	40	85
CNEL:	9	19	41	88

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Joe Friend Ln.
Road Segment: s/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,050 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	172 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.05	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-24.29	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-28.24	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.8	52.5	51.2	45.2	53.6	54.2
Medium Trucks:	48.6	45.5	38.0	46.8	52.9	53.0
Heavy Trucks:	51.9	48.6	45.2	49.8	56.0	56.1
Vehicle Noise:	56.7	54.6	52.3	52.5	59.2	59.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	26	57
CNEL:	6	13	27	59

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Vista Del Sol
Road Segment: n/o Betty Ford Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	119 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	10 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-19.40	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-36.64	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-40.60	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	41.4	40.2	38.8	32.8	41.2	41.9
Medium Trucks:	36.3	33.2	25.7	34.4	40.6	40.6
Heavy Trucks:	39.5	36.2	32.8	37.5	43.7	43.8
Vehicle Noise:	44.3	42.2	40.0	40.1	46.8	47.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	1	2	4	9
CNEL:	1	2	4	9

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Vista Del Sol
Road Segment: n/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,252 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	105 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-9.19	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-26.43	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-30.38	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.6	50.4	49.1	43.0	51.5	52.1
Medium Trucks:	46.5	43.4	35.9	44.6	50.8	50.8
Heavy Trucks:	49.7	46.4	43.0	47.7	53.9	54.0
Vehicle Noise:	54.5	52.4	50.2	50.3	57.0	57.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	9	19	41
CNEL:	4	9	20	42

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: MacMillan Wy.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,374 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	283 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.88	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.12	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.08	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.9	54.7	53.4	47.3	55.8	56.4
Medium Trucks:	50.8	47.7	40.2	48.9	55.1	55.1
Heavy Trucks:	54.0	50.7	47.3	52.0	58.2	58.3
Vehicle Noise:	58.8	56.7	54.5	54.6	61.3	61.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	17	37	79
CNEL:	8	18	38	82

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Street A
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,074 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	174 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.00	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-24.24	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-28.19	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.8	52.6	51.2	45.2	53.7	54.3
Medium Trucks:	48.7	45.6	38.1	46.8	53.0	53.0
Heavy Trucks:	51.9	48.6	45.2	49.9	56.1	56.2
Vehicle Noise:	56.7	54.6	52.4	52.5	59.2	59.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	27	57
CNEL:	6	13	28	59

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Betty Ford Wy.
Road Segment: e/o Joe Friend Ln.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	887 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	74 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-10.69	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-27.92	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-31.88	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	50.1	48.9	47.6	41.5	50.0	50.6
Medium Trucks:	45.0	41.9	34.4	43.1	49.3	49.3
Heavy Trucks:	48.2	44.9	41.5	46.2	52.4	52.5
Vehicle Noise:	53.0	50.9	48.7	48.8	55.5	55.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	3	7	15	33
CNEL:	3	7	16	34

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Country Club Dr.
Road Segment: w/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,680 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	811 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	48.724
Medium Trucks:	48.542
Heavy Trucks:	48.560

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.86	0.07	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-20.10	0.09	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.05	0.09	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.5	63.2	61.9	55.9	64.3	64.9
Medium Trucks:	58.2	55.1	47.6	56.4	62.5	62.6
Heavy Trucks:	59.1	55.8	52.4	57.1	63.3	63.4
Vehicle Noise:	66.3	64.5	62.5	61.2	68.2	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	90	194	417
CNEL:	44	94	203	437

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Country Club Dr.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,794 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,240 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.48	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-18.71	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.67	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	66.6	65.3	59.3	67.7	68.3
Medium Trucks:	61.4	58.3	50.8	59.5	65.7	65.7
Heavy Trucks:	61.8	58.6	55.2	59.8	66.0	66.1
Vehicle Noise:	69.5	67.7	65.8	64.3	71.3	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	67	145	313	674
CNEL:	71	152	329	708

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Hazelden Betty Ford Cent
Road Name: Country Club Dr. | Job Number: 12720
Road Segment: e/o John L. Sinn Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,931 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,586 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.40	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-17.64	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.60	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.7	66.3	60.3	68.8	69.4
Medium Trucks:	62.5	59.4	51.9	60.6	66.8	66.8
Heavy Trucks:	62.9	59.6	56.2	60.9	67.1	67.2
Vehicle Noise:	70.6	68.8	66.9	65.4	72.4	72.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	79	171	369	794
CNEL:	83	180	387	834

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Hazelden Betty Ford Cent
Road Name: Country Club Dr. | Job Number: 12720
Road Segment: e/o Vista Del Sol

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,753 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,655 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.22	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-17.46	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.41	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	67.8	66.5	60.5	68.9	69.6
Medium Trucks:	62.7	59.5	52.0	60.8	67.0	67.0
Heavy Trucks:	63.1	59.8	56.4	61.1	67.3	67.4
Vehicle Noise:	70.8	69.0	67.1	65.6	72.6	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	82	176	379	817
CNEL:	86	185	398	858

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: Hazelden Betty Ford Cent
Road Name: Bob Hope Dr. | Job Number: 12720
Road Segment: n/o MacMillan Wy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,779 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,993 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.04	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.19	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.15	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.6	67.4	66.0	60.0	68.5	69.1
Medium Trucks:	62.4	59.3	51.7	60.5	66.7	66.7
Heavy Trucks:	63.2	59.9	56.6	61.2	67.4	67.5
Vehicle Noise:	70.4	68.6	66.7	65.4	72.3	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	79	170	366	788
CNEL:	83	178	383	826

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: Hazelden Betty Ford Cent
Road Name: Bob Hope Dr. | Job Number: 12720
Road Segment: s/o Street A

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,249 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,613 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.13	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-17.11	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.07	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.7	66.4	65.1	59.1	67.5	68.2
Medium Trucks:	61.5	58.3	50.8	59.6	65.8	65.8
Heavy Trucks:	62.3	59.0	55.6	60.3	66.5	66.6
Vehicle Noise:	69.5	67.7	65.7	64.5	71.4	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	68	147	318	684
CNEL:	72	155	333	717

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Bob Hope Dr.
Road Segment: s/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,821 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,661 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.25	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.99	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.94	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	66.6	65.3	59.2	67.7	68.3
Medium Trucks:	61.6	58.5	51.0	59.7	65.9	65.9
Heavy Trucks:	62.4	59.2	55.8	60.4	66.6	66.7
Vehicle Noise:	69.7	67.8	65.9	64.6	71.6	71.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	70	150	324	698
CNEL:	73	158	340	731

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: John L. Sinn Rd.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,923 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	329 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.23	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.47	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.42	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.6	55.3	54.0	48.0	56.4	57.0
Medium Trucks:	51.5	48.3	40.8	49.6	55.7	55.8
Heavy Trucks:	54.7	51.4	48.0	52.6	58.8	58.9
Vehicle Noise:	59.5	57.4	55.1	55.3	62.0	62.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	41	88
CNEL:	9	20	42	91

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Joe Friend Ln.
Road Segment: s/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,106 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	177 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.93	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-24.17	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-28.12	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.9	52.6	51.3	45.3	53.7	54.3
Medium Trucks:	48.8	45.6	38.1	46.9	53.0	53.1
Heavy Trucks:	52.0	48.7	45.3	49.9	56.1	56.2
Vehicle Noise:	56.8	54.7	52.4	52.6	59.3	59.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	27	58
CNEL:	6	13	28	60

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Vista Del Sol
Road Segment: n/o Betty Ford Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	175 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	15 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-17.73	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-34.97	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-38.92	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	43.1	41.8	40.5	34.5	42.9	43.5
Medium Trucks:	38.0	34.8	27.3	36.1	42.2	42.3
Heavy Trucks:	41.2	37.9	34.5	39.1	45.3	45.4
Vehicle Noise:	46.0	43.9	41.6	41.8	48.5	48.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	1	2	5	11
CNEL:	1	2	5	11

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: Hazelden Betty Ford Cent
Road Name: Vista Del Sol | Job Number: 12720
Road Segment: n/o Country Club Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,476 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	124 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-8.48	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-25.71	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-29.67	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.3	51.1	49.8	43.8	52.2	52.8
Medium Trucks:	47.2	44.1	36.6	45.3	51.5	51.5
Heavy Trucks:	50.4	47.2	43.8	48.4	54.6	54.7
Vehicle Noise:	55.2	53.1	50.9	51.0	57.7	58.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	21	46
CNEL:	5	10	22	47

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: Hazelden Betty Ford Cent
Road Name: MacMillan Wy. | Job Number: 12720
Road Segment: e/o Bob Hope Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,430 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	287 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.81	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-22.05	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-26.01	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.0	54.7	53.4	47.4	55.8	56.5
Medium Trucks:	50.9	47.7	40.2	49.0	55.2	55.2
Heavy Trucks:	54.1	50.8	47.4	52.1	58.3	58.4
Vehicle Noise:	58.9	56.8	54.6	54.7	61.4	61.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	17	37	80
CNEL:	8	18	39	83

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: Hazelden Betty Ford Cent
Road Name: Street A | Job Number: 12720
Road Segment: e/o Bob Hope Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,130 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	179 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.88	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-24.12	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-28.08	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.9	52.7	51.4	45.4	53.8	54.4
Medium Trucks:	48.8	45.7	38.2	46.9	53.1	53.1
Heavy Trucks:	52.0	48.7	45.3	50.0	56.2	56.3
Vehicle Noise:	56.8	54.7	52.5	52.6	59.3	59.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	27	58
CNEL:	6	13	28	61

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: Hazelden Betty Ford Cent
Road Name: Betty Ford Wy. | Job Number: 12720
Road Segment: e/o Joe Friend Ln.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,167 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	98 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-9.50	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-26.73	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-30.69	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.3	50.1	48.7	42.7	51.2	51.8
Medium Trucks:	46.2	43.1	35.6	44.3	50.5	50.5
Heavy Trucks:	49.4	46.1	42.7	47.4	53.6	53.7
Vehicle Noise:	54.2	52.1	49.9	50.0	56.7	57.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	8	18	39
CNEL:	4	9	19	41

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Country Club Dr.
Road Segment: w/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,792 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	821 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	48.724
Medium Trucks:	48.542
Heavy Trucks:	48.560

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.81	0.07	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-20.05	0.09	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.00	0.09	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.5	63.3	62.0	55.9	64.4	65.0
Medium Trucks:	58.3	55.2	47.7	56.4	62.6	62.6
Heavy Trucks:	59.1	55.9	52.5	57.1	63.3	63.4
Vehicle Noise:	66.4	64.5	62.6	61.3	68.3	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	91	195	421
CNEL:	44	95	205	441

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Country Club Dr.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,906 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,249 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.44	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-18.68	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.64	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.9	66.6	65.3	59.3	67.7	68.3
Medium Trucks:	61.4	58.3	50.8	59.6	65.7	65.8
Heavy Trucks:	61.9	58.6	55.2	59.8	66.0	66.1
Vehicle Noise:	69.6	67.8	65.8	64.3	71.4	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	68	146	314	677
CNEL:	71	153	330	711

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Country Club Dr.
Road Segment: e/o John L. Sinn Rd.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,043 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,596 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.38	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-17.62	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.57	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.7	66.4	60.4	68.8	69.4
Medium Trucks:	62.5	59.4	51.9	60.6	66.8	66.8
Heavy Trucks:	62.9	59.7	56.3	60.9	67.1	67.2
Vehicle Noise:	70.6	68.8	66.9	65.4	72.4	72.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	80	172	370	798
CNEL:	84	180	389	838

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Country Club Dr.
Road Segment: e/o Vista Del Sol
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,033 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,679 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.16	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-17.40	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.35	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	67.9	66.6	60.6	69.0	69.6
Medium Trucks:	62.7	59.6	52.1	60.8	67.0	67.1
Heavy Trucks:	63.1	59.9	56.5	61.1	67.3	67.4
Vehicle Noise:	70.8	69.1	67.1	65.6	72.6	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	83	178	383	825
CNEL:	87	187	402	866

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Bob Hope Dr.
Road Segment: n/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,678 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,152 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.38	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-15.86	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.82	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.7	66.4	60.4	68.8	69.4
Medium Trucks:	62.7	59.6	52.1	60.8	67.0	67.0
Heavy Trucks:	63.6	60.3	56.9	61.5	67.7	67.8
Vehicle Noise:	70.8	69.0	67.0	65.7	72.7	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	83	179	385	829
CNEL:	87	187	403	869

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Bob Hope Dr.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,775 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,741 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.46	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.78	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.74	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.8	65.5	59.5	67.9	68.5
Medium Trucks:	61.8	58.7	51.2	59.9	66.1	66.1
Heavy Trucks:	62.6	59.4	56.0	60.6	66.8	66.9
Vehicle Noise:	69.9	68.0	66.1	64.8	71.8	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	155	334	720
CNEL:	75	163	350	755

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Bob Hope Dr.
Road Segment: s/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,394 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,793 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.58	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.65	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.61	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.1	66.9	65.6	59.6	68.0	68.6
Medium Trucks:	61.9	58.8	51.3	60.0	66.2	66.3
Heavy Trucks:	62.8	59.5	56.1	60.7	66.9	67.0
Vehicle Noise:	70.0	68.2	66.2	64.9	71.9	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	158	341	734
CNEL:	77	166	357	770

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: John L. Sinn Rd.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,065 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	341 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.08	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.31	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.27	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	55.5	54.2	48.2	56.6	57.2
Medium Trucks:	51.6	48.5	41.0	49.7	55.9	55.9
Heavy Trucks:	54.8	51.6	48.2	52.8	59.0	59.1
Vehicle Noise:	59.6	57.5	55.3	55.4	62.1	62.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	42	90
CNEL:	9	20	43	93

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Joe Friend Ln.
Road Segment: s/o MacMillan Wy.

Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,219 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	186 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.70	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.94	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.90	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.1	52.9	51.5	45.5	53.9	54.6
Medium Trucks:	49.0	45.9	38.4	47.1	53.3	53.3
Heavy Trucks:	52.2	48.9	45.5	50.2	56.4	56.5
Vehicle Noise:	57.0	54.9	52.7	52.8	59.5	59.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	60
CNEL:	6	13	29	62

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Vista Del Sol
Road Segment: n/o Betty Ford Wy.

Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	129 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	11 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-19.06	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-36.30	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-40.25	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	41.7	40.5	39.2	33.2	41.6	42.2
Medium Trucks:	36.6	33.5	26.0	34.7	40.9	41.0
Heavy Trucks:	39.8	36.6	33.2	37.8	44.0	44.1
Vehicle Noise:	44.7	42.6	40.3	40.5	47.2	47.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	1	2	4	9
CNEL:	1	2	4	9

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Vista Del Sol
Road Segment: n/o Country Club Dr.

Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,355 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	114 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-8.85	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-26.09	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-30.04	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.0	50.7	49.4	43.4	51.8	52.4
Medium Trucks:	46.8	43.7	36.2	45.0	51.1	51.2
Heavy Trucks:	50.1	46.8	43.4	48.0	54.2	54.3
Vehicle Noise:	54.9	52.8	50.5	50.7	57.4	57.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	9	20	43
CNEL:	4	10	21	45

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: MacMillan Wy.
Road Segment: e/o Bob Hope Dr.

Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,652 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	306 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.54	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.78	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.73	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.3	55.0	53.7	47.7	56.1	56.7
Medium Trucks:	51.1	48.0	40.5	49.3	55.4	55.5
Heavy Trucks:	54.4	51.1	47.7	52.3	58.5	58.6
Vehicle Noise:	59.2	57.1	54.8	55.0	61.7	61.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	18	39	84
CNEL:	9	19	40	87

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Street A
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,245 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	188 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.65	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.89	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.85	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.1	52.9	51.6	45.6	54.0	54.6
Medium Trucks:	49.0	45.9	38.4	47.2	53.3	53.4
Heavy Trucks:	52.2	49.0	45.6	50.2	56.4	56.5
Vehicle Noise:	57.1	55.0	52.7	52.9	59.6	59.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	60
CNEL:	6	14	29	63

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Betty Ford Wy.
Road Segment: e/o Joe Friend Ln.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	960 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	80 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-10.34	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-27.58	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-31.54	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	50.5	49.2	47.9	41.9	50.3	50.9
Medium Trucks:	45.3	42.2	34.7	43.5	49.6	49.7
Heavy Trucks:	48.6	45.3	41.9	46.5	52.7	52.8
Vehicle Noise:	53.4	51.3	49.0	49.2	55.9	56.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	3	7	16	34
CNEL:	4	8	17	36

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Country Club Dr.
Road Segment: w/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,478 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	878 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	48.724
Medium Trucks:	48.542
Heavy Trucks:	48.560

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.52	0.07	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-19.75	0.09	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.71	0.09	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.8	63.6	62.3	56.2	64.7	65.3
Medium Trucks:	58.6	55.5	48.0	56.7	62.9	62.9
Heavy Trucks:	59.4	56.2	52.8	57.4	63.6	63.7
Vehicle Noise:	66.7	64.8	62.9	61.6	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	204	440
CNEL:	46	99	214	461

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Country Club Dr.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,014 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,342 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.13	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-18.37	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.33	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.2	66.9	65.6	59.6	68.0	68.7
Medium Trucks:	61.8	58.6	51.1	59.9	66.0	66.1
Heavy Trucks:	62.2	58.9	55.5	60.1	66.3	66.4
Vehicle Noise:	69.9	68.1	66.2	64.7	71.7	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	71	153	330	711
CNEL:	75	161	346	746

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Country Club Dr.
Road Segment: e/o John L. Sinn Rd.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,491 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,717 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.06	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-17.30	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.25	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.2	68.0	66.7	60.7	69.1	69.7
Medium Trucks:	62.8	59.7	52.2	60.9	67.1	67.2
Heavy Trucks:	63.2	60.0	56.6	61.2	67.4	67.5
Vehicle Noise:	70.9	69.2	67.2	65.7	72.7	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	180	389	838
CNEL:	88	189	408	879

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Country Club Dr.
Road Segment: e/o Vista Del Sol
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,382 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,792 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.12	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-17.11	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.07	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.4	68.2	66.9	60.9	69.3	69.9
Medium Trucks:	63.0	59.9	52.4	61.1	67.3	67.3
Heavy Trucks:	63.4	60.2	56.8	61.4	67.6	67.7
Vehicle Noise:	71.1	69.3	67.4	65.9	72.9	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	86	186	400	862
CNEL:	90	195	420	905

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P
Road Name: Bob Hope Dr.
Road Segment: n/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,734 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,157 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.39	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-15.85	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.81	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.7	66.4	60.4	68.8	69.4
Medium Trucks:	62.7	59.6	52.1	60.8	67.0	67.1
Heavy Trucks:	63.6	60.3	56.9	61.5	67.7	67.8
Vehicle Noise:	70.8	69.0	67.0	65.7	72.7	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	83	179	386	831
CNEL:	87	188	404	871

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P
Road Name: Bob Hope Dr.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,831 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,746 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.47	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.77	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.73	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.8	65.5	59.5	67.9	68.5
Medium Trucks:	61.8	58.7	51.2	59.9	66.1	66.1
Heavy Trucks:	62.7	59.4	56.0	60.6	66.8	66.9
Vehicle Noise:	69.9	68.0	66.1	64.8	71.8	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	155	335	721
CNEL:	76	163	351	756

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P
Road Name: Bob Hope Dr.
Road Segment: s/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,450 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,798 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.60	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.64	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.60	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.2	66.9	65.6	59.6	68.0	68.6
Medium Trucks:	61.9	58.8	51.3	60.1	66.2	66.3
Heavy Trucks:	62.8	59.5	56.1	60.8	67.0	67.0
Vehicle Noise:	70.0	68.2	66.2	64.9	71.9	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	74	158	341	736
CNEL:	77	166	358	771

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P
Road Name: John L. Sinn Rd.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,233 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	355 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.90	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.14	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.09	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.9	55.7	54.3	48.3	56.8	57.4
Medium Trucks:	51.8	48.7	41.2	49.9	56.1	56.1
Heavy Trucks:	55.0	51.7	48.3	53.0	59.2	59.3
Vehicle Noise:	59.8	57.7	55.5	55.6	62.3	62.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	20	43	92
CNEL:	10	21	44	96

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P
Road Name: Joe Friend Ln.
Road Segment: s/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,275 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	191 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.60	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.83	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.79	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.2	53.0	51.6	45.6	54.1	54.7
Medium Trucks:	49.1	46.0	38.5	47.2	53.4	53.4
Heavy Trucks:	52.3	49.0	45.6	50.3	56.5	56.6
Vehicle Noise:	57.1	55.0	52.8	52.9	59.6	59.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	61
CNEL:	6	14	29	63

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P
Road Name: Vista Del Sol
Road Segment: n/o Betty Ford Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	185 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	16 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-17.49	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-34.73	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-38.69	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	43.3	42.1	40.8	34.7	43.2	43.8
Medium Trucks:	38.2	35.1	27.6	36.3	42.5	42.5
Heavy Trucks:	41.4	38.1	34.7	39.4	45.6	45.7
Vehicle Noise:	46.2	44.1	41.9	42.0	48.7	49.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	1	2	5	11
CNEL:	1	3	6	12

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P
Road Name: Vista Del Sol
Road Segment: n/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,579 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	132 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-8.18	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-25.42	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-29.38	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.6	51.4	50.1	44.0	52.5	53.1
Medium Trucks:	47.5	44.4	36.9	45.6	51.8	51.8
Heavy Trucks:	50.7	47.4	44.0	48.7	54.9	55.0
Vehicle Noise:	55.5	53.4	51.2	51.3	58.0	58.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	22	48
CNEL:	5	11	23	50

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P
Road Name: MacMillan Wy.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,708 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	311 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.47	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.71	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.67	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.3	55.1	53.8	47.8	56.2	56.8
Medium Trucks:	51.2	48.1	40.6	49.3	55.5	55.5
Heavy Trucks:	54.4	51.2	47.8	52.4	58.6	58.7
Vehicle Noise:	59.2	57.1	54.9	55.0	61.7	62.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	18	39	84
CNEL:	9	19	41	88

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P
Road Name: Street A
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,301 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	193 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.55	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.78	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.74	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.3	53.0	51.7	45.7	54.1	54.7
Medium Trucks:	49.1	46.0	38.5	47.3	53.4	53.5
Heavy Trucks:	52.4	49.1	45.7	50.3	56.5	56.6
Vehicle Noise:	57.2	55.1	52.8	53.0	59.7	59.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	29	61
CNEL:	6	14	30	64

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P
Road Name: Betty Ford Wy.
Road Segment: e/o Joe Friend Ln.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,240 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	104 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-9.23	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-26.47	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-30.43	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.6	50.3	49.0	43.0	51.4	52.0
Medium Trucks:	46.5	43.3	35.8	44.6	50.7	50.8
Heavy Trucks:	49.7	46.4	43.0	47.6	53.8	53.9
Vehicle Noise:	54.5	52.4	50.1	50.3	57.0	57.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	9	19	41
CNEL:	4	9	20	42

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P | Project Name: Hazelden Betty Ford Cent
Road Name: Country Club Dr. | Job Number: 12720
Road Segment: w/o Bob Hope Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,590 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	887 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	48.724
Medium Trucks:	48.542
Heavy Trucks:	48.560

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.47	0.07	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-19.71	0.09	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.66	0.09	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.9	63.6	62.3	56.3	64.7	65.3
Medium Trucks:	58.6	55.5	48.0	56.8	62.9	63.0
Heavy Trucks:	59.5	56.2	52.8	57.4	63.6	63.7
Vehicle Noise:	66.7	64.9	62.9	61.6	68.6	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	206	443
CNEL:	46	100	216	464

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P | Project Name: Hazelden Betty Ford Cent
Road Name: Country Club Dr. | Job Number: 12720
Road Segment: e/o Bob Hope Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,126 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,351 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.10	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-18.34	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.30	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.2	67.0	65.6	59.6	68.1	68.7
Medium Trucks:	61.8	58.7	51.2	59.9	66.1	66.1
Heavy Trucks:	62.2	58.9	55.5	60.2	66.4	66.5
Vehicle Noise:	69.9	68.1	66.2	64.7	71.7	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	71	154	331	714
CNEL:	75	162	348	750

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P | Project Name: Hazelden Betty Ford Cent
Road Name: Country Club Dr. | Job Number: 12720
Road Segment: e/o John L. Sinn Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,603 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,727 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.04	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-17.28	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.23	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.3	68.0	66.7	60.7	69.1	69.7
Medium Trucks:	62.9	59.7	52.2	61.0	67.1	67.2
Heavy Trucks:	63.3	60.0	56.6	61.2	67.4	67.5
Vehicle Noise:	71.0	69.2	67.3	65.7	72.8	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	181	390	841
CNEL:	88	190	410	883

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA+P | Project Name: Hazelden Betty Ford Cent
Road Name: Country Club Dr. | Job Number: 12720
Road Segment: e/o Vista Del Sol

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,662 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,815 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.18	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-17.06	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.01	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	68.2	66.9	60.9	69.3	70.0
Medium Trucks:	63.1	59.9	52.4	61.2	67.4	67.4
Heavy Trucks:	63.5	60.2	56.8	61.5	67.7	67.8
Vehicle Noise:	71.2	69.4	67.5	66.0	73.0	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	87	187	403	869
CNEL:	91	197	424	913

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Bob Hope Dr.
Road Segment: n/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,108 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,272 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.61	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-15.63	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.58	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.2	67.9	66.6	60.6	69.0	69.7
Medium Trucks:	62.9	59.8	52.3	61.1	67.2	67.3
Heavy Trucks:	63.8	60.5	57.1	61.8	68.0	68.1
Vehicle Noise:	71.0	69.2	67.2	65.9	72.9	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	86	185	399	860
CNEL:	90	194	418	901

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Bob Hope Dr.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,205 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,861 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.75	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.49	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.45	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.3	67.1	65.8	59.7	68.2	68.8
Medium Trucks:	62.1	59.0	51.5	60.2	66.4	66.4
Heavy Trucks:	62.9	59.7	56.3	60.9	67.1	67.2
Vehicle Noise:	70.1	68.3	66.4	65.1	72.0	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	75	162	349	753
CNEL:	79	170	366	789

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Bob Hope Dr.
Road Segment: s/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,564 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,891 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.82	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.42	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.38	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	67.1	65.8	59.8	68.2	68.9
Medium Trucks:	62.2	59.0	51.5	60.3	66.4	66.5
Heavy Trucks:	63.0	59.7	56.3	61.0	67.2	67.3
Vehicle Noise:	70.2	68.4	66.4	65.1	72.1	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	164	353	761
CNEL:	80	172	370	797

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: John L. Sinn Rd.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,065 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	341 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.08	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.31	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.27	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	55.5	54.2	48.2	56.6	57.2
Medium Trucks:	51.6	48.5	41.0	49.7	55.9	55.9
Heavy Trucks:	54.8	51.6	48.2	52.8	59.0	59.1
Vehicle Noise:	59.6	57.5	55.3	55.4	62.1	62.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	42	90
CNEL:	9	20	43	93

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Joe Friend Ln.
Road Segment: s/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,219 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	186 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.70	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.94	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.90	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.1	52.9	51.5	45.5	53.9	54.6
Medium Trucks:	49.0	45.9	38.4	47.1	53.3	53.3
Heavy Trucks:	52.2	48.9	45.5	50.2	56.4	56.5
Vehicle Noise:	57.0	54.9	52.7	52.8	59.5	59.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	60
CNEL:	6	13	29	62

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Vista Del Sol
Road Segment: n/o Betty Ford Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	213 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	18 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-16.88	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-34.12	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-38.08	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	43.9	42.7	41.4	35.4	43.8	44.4
Medium Trucks:	38.8	35.7	28.2	36.9	43.1	43.1
Heavy Trucks:	42.0	38.7	35.3	40.0	46.2	46.3
Vehicle Noise:	46.8	44.7	42.5	42.6	49.3	49.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	1	3	6	13
CNEL:	1	3	6	13

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Vista Del Sol
Road Segment: n/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,439 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	121 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-8.59	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-25.82	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-29.78	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.2	51.0	49.7	43.6	52.1	52.7
Medium Trucks:	47.1	44.0	36.5	45.2	51.4	51.4
Heavy Trucks:	50.3	47.0	43.6	48.3	54.5	54.6
Vehicle Noise:	55.1	53.0	50.8	50.9	57.6	57.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	10	21	45
CNEL:	5	10	22	47

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: MacMillan Wy.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,652 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	306 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.54	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.78	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.73	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.3	55.0	53.7	47.7	56.1	56.7
Medium Trucks:	51.1	48.0	40.5	49.3	55.4	55.5
Heavy Trucks:	54.4	51.1	47.7	52.3	58.5	58.6
Vehicle Noise:	59.2	57.1	54.8	55.0	61.7	61.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	18	39	84
CNEL:	9	19	40	87

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Street A
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,245 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	188 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.65	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.89	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.85	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.1	52.9	51.6	45.6	54.0	54.6
Medium Trucks:	49.0	45.9	38.4	47.2	53.3	53.4
Heavy Trucks:	52.2	49.0	45.6	50.2	56.4	56.5
Vehicle Noise:	57.1	55.0	52.7	52.9	59.6	59.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	60
CNEL:	6	14	29	63

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Betty Ford Wy.
Road Segment: e/o Joe Friend Ln.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	960 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	80 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-10.34	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-27.58	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-31.54	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	50.5	49.2	47.9	41.9	50.3	50.9
Medium Trucks:	45.3	42.2	34.7	43.5	49.6	49.7
Heavy Trucks:	48.6	45.3	41.9	46.5	52.7	52.8
Vehicle Noise:	53.4	51.3	49.0	49.2	55.9	56.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	3	7	16	34
CNEL:	4	8	17	36

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Country Club Dr.
Road Segment: w/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,648 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	892 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	48.724
Medium Trucks:	48.542
Heavy Trucks:	48.560

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.45	0.07	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-19.68	0.09	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.64	0.09	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.9	63.6	62.3	56.3	64.7	65.4
Medium Trucks:	58.7	55.5	48.0	56.8	62.9	63.0
Heavy Trucks:	59.5	56.2	52.8	57.5	63.7	63.8
Vehicle Noise:	66.7	64.9	62.9	61.7	68.6	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	96	206	445
CNEL:	47	100	216	466

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Country Club Dr.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,706 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.95	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-18.19	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.14	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	67.1	65.8	59.8	68.2	68.8
Medium Trucks:	61.9	58.8	51.3	60.1	66.2	66.3
Heavy Trucks:	62.4	59.1	55.7	60.3	66.5	66.6
Vehicle Noise:	70.1	68.3	66.3	64.8	71.9	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	157	339	731
CNEL:	77	165	356	768

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Country Club Dr.
Road Segment: e/o John L. Sinn Rd.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,007 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,760 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.05	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-17.19	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.15	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.4	68.1	66.8	60.8	69.2	69.8
Medium Trucks:	62.9	59.8	52.3	61.1	67.2	67.3
Heavy Trucks:	63.4	60.1	56.7	61.3	67.5	67.6
Vehicle Noise:	71.1	69.3	67.3	65.8	72.8	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	85	183	395	852
CNEL:	89	193	415	894

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Country Club Dr.
Road Segment: e/o Vista Del Sol
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,838 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,830 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.22	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-17.02	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-20.98	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	68.3	67.0	61.0	69.4	70.0
Medium Trucks:	63.1	60.0	52.5	61.2	67.4	67.4
Heavy Trucks:	63.5	60.2	56.9	61.5	67.7	67.8
Vehicle Noise:	71.2	69.4	67.5	66.0	73.0	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	87	188	406	874
CNEL:	92	198	426	918

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Bob Hope Dr.
Road Segment: n/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,164 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,276 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.62	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-15.62	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.57	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.2	67.9	66.6	60.6	69.0	69.7
Medium Trucks:	63.0	59.8	52.3	61.1	67.2	67.3
Heavy Trucks:	63.8	60.5	57.1	61.8	68.0	68.1
Vehicle Noise:	71.0	69.2	67.2	66.0	72.9	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	86	186	400	861
CNEL:	90	194	419	902

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Bob Hope Dr.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,261 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,865 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.76	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.48	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.44	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.3	67.1	65.8	59.8	68.2	68.8
Medium Trucks:	62.1	59.0	51.5	60.2	66.4	66.4
Heavy Trucks:	62.9	59.7	56.3	60.9	67.1	67.2
Vehicle Noise:	70.2	68.3	66.4	65.1	72.1	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	75	162	350	754
CNEL:	79	170	367	790

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Bob Hope Dr.
Road Segment: s/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,620 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,896 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.83	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.41	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.37	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	67.1	65.8	59.8	68.2	68.9
Medium Trucks:	62.2	59.0	51.5	60.3	66.5	66.5
Heavy Trucks:	63.0	59.7	56.3	61.0	67.2	67.3
Vehicle Noise:	70.2	68.4	66.4	65.2	72.1	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	164	354	762
CNEL:	80	172	371	799

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: John L. Sinn Rd.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,233 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	355 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.90	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.14	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.09	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.9	55.7	54.3	48.3	56.8	57.4
Medium Trucks:	51.8	48.7	41.2	49.9	56.1	56.1
Heavy Trucks:	55.0	51.7	48.3	53.0	59.2	59.3
Vehicle Noise:	59.8	57.7	55.5	55.6	62.3	62.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	20	43	92
CNEL:	10	21	44	96

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Joe Friend Ln.
Road Segment: s/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,275 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	191 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.60	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.83	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.79	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.2	53.0	51.6	45.6	54.1	54.7
Medium Trucks:	49.1	46.0	38.5	47.2	53.4	53.4
Heavy Trucks:	52.3	49.0	45.6	50.3	56.5	56.6
Vehicle Noise:	57.1	55.0	52.8	52.9	59.6	59.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	61
CNEL:	6	14	29	63

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Vista Del Sol
Road Segment: n/o Betty Ford Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	269 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	23 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-15.87	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-33.11	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-37.06	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	44.9	43.7	42.4	36.4	44.8	45.4
Medium Trucks:	39.8	36.7	29.2	37.9	44.1	44.1
Heavy Trucks:	43.0	39.8	36.4	41.0	47.2	47.3
Vehicle Noise:	47.8	45.7	43.5	43.6	50.4	50.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	1	3	7	15
CNEL:	2	3	7	15

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Vista Del Sol
Road Segment: n/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,663 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	139 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.96	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-25.20	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-29.15	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.8	51.6	50.3	44.3	52.7	53.3
Medium Trucks:	47.7	44.6	37.1	45.8	52.0	52.1
Heavy Trucks:	50.9	47.7	44.3	48.9	55.1	55.2
Vehicle Noise:	55.8	53.7	51.4	51.6	58.3	58.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	11	23	49
CNEL:	5	11	24	51

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: MacMillan Wy.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,708 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	311 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.47	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.71	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.67	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.3	55.1	53.8	47.8	56.2	56.8
Medium Trucks:	51.2	48.1	40.6	49.3	55.5	55.5
Heavy Trucks:	54.4	51.2	47.8	52.4	58.6	58.7
Vehicle Noise:	59.2	57.1	54.9	55.0	61.7	62.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	18	39	84
CNEL:	9	19	41	88

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Street A
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,301 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	193 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.55	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.78	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.74	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.3	53.0	51.7	45.7	54.1	54.7
Medium Trucks:	49.1	46.0	38.5	47.3	53.4	53.5
Heavy Trucks:	52.4	49.1	45.7	50.3	56.5	56.6
Vehicle Noise:	57.2	55.1	52.8	53.0	59.7	59.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	29	61
CNEL:	6	14	30	64

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Betty Ford Wy.
Road Segment: e/o Joe Friend Ln.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,240 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	104 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-9.23	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-26.47	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-30.43	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.6	50.3	49.0	43.0	51.4	52.0
Medium Trucks:	46.5	43.3	35.8	44.6	50.7	50.8
Heavy Trucks:	49.7	46.4	43.0	47.6	53.8	53.9
Vehicle Noise:	54.5	52.4	50.1	50.3	57.0	57.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	9	19	41
CNEL:	4	9	20	42

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Country Club Dr.
Road Segment: w/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,760 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	902 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	48.724
Medium Trucks:	48.542
Heavy Trucks:	48.560

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.40	0.07	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-19.64	0.09	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.59	0.09	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.9	63.7	62.4	56.4	64.8	65.4
Medium Trucks:	58.7	55.6	48.1	56.8	63.0	63.0
Heavy Trucks:	59.5	56.3	52.9	57.5	63.7	63.8
Vehicle Noise:	66.8	64.9	63.0	61.7	68.7	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	97	208	448
CNEL:	47	101	218	469

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Country Club Dr.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,818 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,409 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.92	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-18.16	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.11	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	67.1	65.8	59.8	68.2	68.9
Medium Trucks:	62.0	58.8	51.3	60.1	66.3	66.3
Heavy Trucks:	62.4	59.1	55.7	60.4	66.6	66.7
Vehicle Noise:	70.1	68.3	66.4	64.9	71.9	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	158	341	734
CNEL:	77	166	358	771

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Country Club Dr.
Road Segment: e/o John L. Sinn Rd.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,119 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,770 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.07	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-17.17	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.12	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.4	68.1	66.8	60.8	69.2	69.9
Medium Trucks:	63.0	59.8	52.3	61.1	67.2	67.3
Heavy Trucks:	63.4	60.1	56.7	61.4	67.6	67.6
Vehicle Noise:	71.1	69.3	67.4	65.9	72.9	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	85	184	397	855
CNEL:	90	193	417	897

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC+P
Road Name: Country Club Dr.
Road Segment: e/o Vista Del Sol
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,118 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	1,853 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.27	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-16.97	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-20.92	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	68.3	67.0	61.0	69.4	70.1
Medium Trucks:	63.2	60.0	52.5	61.3	67.5	67.5
Heavy Trucks:	63.6	60.3	56.9	61.6	67.8	67.8
Vehicle Noise:	71.3	69.5	67.6	66.1	73.1	73.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	88	190	409	881
CNEL:	93	199	430	925

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Bob Hope Dr.
Road Segment: n/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,881 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,504 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.04	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-15.20	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.16	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	68.4	67.0	61.0	69.4	70.1
Medium Trucks:	63.4	60.2	52.7	61.5	67.7	67.7
Heavy Trucks:	64.2	60.9	57.5	62.2	68.4	68.5
Vehicle Noise:	71.4	69.6	67.6	66.4	73.3	73.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	92	198	426	918
CNEL:	96	207	446	962

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Bob Hope Dr.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,487 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,052 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.17	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.07	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.02	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.7	67.5	66.2	60.2	68.6	69.2
Medium Trucks:	62.5	59.4	51.9	60.6	66.8	66.8
Heavy Trucks:	63.4	60.1	56.7	61.3	67.5	67.6
Vehicle Noise:	70.6	68.7	66.8	65.5	72.5	72.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	80	173	373	804
CNEL:	84	181	391	842

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Bob Hope Dr.
Road Segment: s/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,882 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,085 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.24	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.00	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.95	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.8	67.6	66.2	60.2	68.7	69.3
Medium Trucks:	62.6	59.4	51.9	60.7	66.9	66.9
Heavy Trucks:	63.4	60.1	56.8	61.4	67.6	67.7
Vehicle Noise:	70.6	68.8	66.9	65.6	72.5	72.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	81	175	377	812
CNEL:	85	183	395	851

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: John L. Sinn Rd.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,656 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	390 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.49	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.72	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.68	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.3	56.1	54.8	48.7	57.2	57.8
Medium Trucks:	52.2	49.1	41.6	50.3	56.5	56.5
Heavy Trucks:	55.4	52.1	48.7	53.4	59.6	59.7
Vehicle Noise:	60.2	58.1	55.9	56.0	62.7	63.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	10	21	46	98
CNEL:	10	22	47	102

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Joe Friend Ln.
Road Segment: s/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,503 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	210 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.18	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.42	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.38	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.6	53.4	52.1	46.1	54.5	55.1
Medium Trucks:	49.5	46.4	38.9	47.6	53.8	53.8
Heavy Trucks:	52.7	49.4	46.0	50.7	56.9	57.0
Vehicle Noise:	57.5	55.4	53.2	53.3	60.0	60.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	14	30	65
CNEL:	7	15	31	67

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Vista Del Sol
Road Segment: n/o Betty Ford Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,199 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	184 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.74	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.98	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.94	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.1	52.8	51.5	45.5	53.9	54.5
Medium Trucks:	48.9	45.8	38.3	47.1	53.2	53.3
Heavy Trucks:	52.2	48.9	45.5	50.1	56.3	56.4
Vehicle Noise:	57.0	54.9	52.6	52.8	59.5	59.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	60
CNEL:	6	13	29	62

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Vista Del Sol
Road Segment: n/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,199 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	184 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.74	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.98	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.94	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.1	52.8	51.5	45.5	53.9	54.5
Medium Trucks:	48.9	45.8	38.3	47.1	53.2	53.3
Heavy Trucks:	52.2	48.9	45.5	50.1	56.3	56.4
Vehicle Noise:	57.0	54.9	52.6	52.8	59.5	59.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	60
CNEL:	6	13	29	62

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: MacMillan Wy.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,079 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	342 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.06	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.30	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.25	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	55.5	54.2	48.2	56.6	57.2
Medium Trucks:	51.6	48.5	41.0	49.7	55.9	56.0
Heavy Trucks:	54.8	51.6	48.2	52.8	59.0	59.1
Vehicle Noise:	59.6	57.5	55.3	55.5	62.2	62.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	42	90
CNEL:	9	20	43	93

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Street A
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,531 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	212 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.13	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.37	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.33	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.7	53.4	52.1	46.1	54.5	55.1
Medium Trucks:	49.6	46.4	38.9	47.7	53.8	53.9
Heavy Trucks:	52.8	49.5	46.1	50.7	56.9	57.0
Vehicle Noise:	57.6	55.5	53.2	53.4	60.1	60.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	14	30	65
CNEL:	7	15	32	68

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Betty Ford Wy.
Road Segment: e/o Joe Friend Ln.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,364 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	114 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-8.82	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-26.06	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-30.01	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.0	50.7	49.4	43.4	51.8	52.5
Medium Trucks:	46.9	43.7	36.2	45.0	51.2	51.2
Heavy Trucks:	50.1	46.8	43.4	48.1	54.3	54.4
Vehicle Noise:	54.9	52.8	50.6	50.7	57.4	57.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	4	9	20	43
CNEL:	4	10	21	45

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Country Club Dr.
Road Segment: w/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,124 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,022 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	48.724
Medium Trucks:	48.542
Heavy Trucks:	48.560

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.11	0.07	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.13	0.09	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.09	0.09	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	67.2	65.9	59.9	68.3	68.9
Medium Trucks:	62.2	59.1	51.6	60.3	66.5	66.5
Heavy Trucks:	63.1	59.8	56.4	61.0	67.2	67.3
Vehicle Noise:	70.3	68.4	66.5	65.2	72.2	72.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	77	165	356	767
CNEL:	80	173	373	804

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Country Club Dr.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,458 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,301 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.21	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-16.03	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-19.98	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	69.3	68.0	61.9	70.4	71.0
Medium Trucks:	64.1	61.0	53.5	62.2	68.4	68.4
Heavy Trucks:	64.5	61.2	57.8	62.5	68.7	68.8
Vehicle Noise:	72.2	70.4	68.5	67.0	74.0	74.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	219	473	1,018
CNEL:	107	230	496	1,069

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Country Club Dr.
Road Segment: e/o John L. Sinn Rd.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,458 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,301 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.21	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-16.03	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-19.98	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	69.3	68.0	61.9	70.4	71.0
Medium Trucks:	64.1	61.0	53.5	62.2	68.4	68.4
Heavy Trucks:	64.5	61.2	57.8	62.5	68.7	68.8
Vehicle Noise:	72.2	70.4	68.5	67.0	74.0	74.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	219	473	1,018
CNEL:	107	230	496	1,069

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO
Road Name: Country Club Dr.
Road Segment: e/o Vista Del Sol
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,532 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,307 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.22	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-16.02	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-19.97	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	69.3	68.0	62.0	70.4	71.0
Medium Trucks:	64.1	61.0	53.5	62.2	68.4	68.4
Heavy Trucks:	64.5	61.3	57.9	62.5	68.7	68.8
Vehicle Noise:	72.2	70.4	68.5	67.0	74.0	74.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	220	473	1,020
CNEL:	107	231	497	1,071

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Bob Hope Dr.
Road Segment: n/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,937 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,509 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.04	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-15.19	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.15	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	68.4	67.0	61.0	69.5	70.1
Medium Trucks:	63.4	60.3	52.7	61.5	67.7	67.7
Heavy Trucks:	64.2	60.9	57.6	62.2	68.4	68.5
Vehicle Noise:	71.4	69.6	67.7	66.4	73.3	73.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	92	198	426	919
CNEL:	96	207	447	963

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Bob Hope Dr.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,543 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,057 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.18	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.06	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.01	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.7	67.5	66.2	60.2	68.6	69.2
Medium Trucks:	62.5	59.4	51.9	60.6	66.8	66.8
Heavy Trucks:	63.4	60.1	56.7	61.3	67.5	67.6
Vehicle Noise:	70.6	68.8	66.8	65.5	72.5	72.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	80	173	374	805
CNEL:	84	182	391	843

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Bob Hope Dr.
Road Segment: s/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,938 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,090 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.25	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-15.99	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.94	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.8	67.6	66.3	60.2	68.7	69.3
Medium Trucks:	62.6	59.5	52.0	60.7	66.9	66.9
Heavy Trucks:	63.4	60.2	56.8	61.4	67.6	67.7
Vehicle Noise:	70.7	68.8	66.9	65.6	72.5	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	81	175	378	813
CNEL:	85	184	396	852

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: John L. Sinn Rd.
Road Segment: s/o Street A
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,824 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	404 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-3.33	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-20.57	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-24.53	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.5	56.2	54.9	48.9	57.3	57.9
Medium Trucks:	52.4	49.2	41.7	50.5	56.6	56.7
Heavy Trucks:	55.6	52.3	48.9	53.5	59.7	59.8
Vehicle Noise:	60.4	58.3	56.0	56.2	62.9	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	10	22	47	101
CNEL:	10	22	48	104

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Joe Friend Ln.
Road Segment: s/o MacMillan Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,559 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	214 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.09	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.32	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.28	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.7	53.5	52.2	46.1	54.6	55.2
Medium Trucks:	49.6	46.5	39.0	47.7	53.9	53.9
Heavy Trucks:	52.8	49.5	46.1	50.8	57.0	57.1
Vehicle Noise:	57.6	55.5	53.3	53.4	60.1	60.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	14	31	66
CNEL:	7	15	32	68

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Vista Del Sol
Road Segment: n/o Betty Ford Wy.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,339 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	196 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.48	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.71	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.67	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.3	53.1	51.8	45.8	54.2	54.8
Medium Trucks:	49.2	46.1	38.6	47.3	53.5	53.5
Heavy Trucks:	52.4	49.2	45.8	50.4	56.6	56.7
Vehicle Noise:	57.2	55.1	52.9	53.0	59.7	60.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	29	62
CNEL:	6	14	30	64

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Vista Del Sol
Road Segment: n/o Country Club Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,339 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	196 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.48	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.71	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.67	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.3	53.1	51.8	45.8	54.2	54.8
Medium Trucks:	49.2	46.1	38.6	47.3	53.5	53.5
Heavy Trucks:	52.4	49.2	45.8	50.4	56.6	56.7
Vehicle Noise:	57.2	55.1	52.9	53.0	59.7	60.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	29	62
CNEL:	6	14	30	64

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: MacMillan Wy.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,135 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	346 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-4.00	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-21.24	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-25.20	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.8	55.6	54.2	48.2	56.7	57.3
Medium Trucks:	51.7	48.6	41.1	49.8	56.0	56.0
Heavy Trucks:	54.9	51.6	48.2	52.9	59.1	59.2
Vehicle Noise:	59.7	57.6	55.4	55.5	62.2	62.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	20	42	91
CNEL:	9	20	44	94

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Street A
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,587 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	217 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-6.04	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-23.28	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-27.23	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.8	53.5	52.2	46.2	54.6	55.2
Medium Trucks:	49.6	46.5	39.0	47.8	53.9	54.0
Heavy Trucks:	52.9	49.6	46.2	50.8	57.0	57.1
Vehicle Noise:	57.7	55.6	53.3	53.5	60.2	60.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	14	31	66
CNEL:	7	15	32	69

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Betty Ford Wy.
Road Segment: e/o Joe Friend Ln.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,646 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	138 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (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:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-8.00	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	70.80	-25.24	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	77.97	-29.20	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.8	51.6	50.2	44.2	52.7	53.3
Medium Trucks:	47.7	44.6	37.1	45.8	52.0	52.0
Heavy Trucks:	50.9	47.6	44.2	48.9	55.1	55.2
Vehicle Noise:	55.7	53.6	51.4	51.5	58.2	58.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	11	23	49
CNEL:	5	11	24	51

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Country Club Dr.
Road Segment: w/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,236 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,031 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	48.724
Medium Trucks:	48.542
Heavy Trucks:	48.560

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.13	0.07	-1.20	-4.67	0.000	0.000
Medium Trucks:	79.45	-16.11	0.09	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.07	0.09	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.5	67.2	65.9	59.9	68.3	68.9
Medium Trucks:	62.2	59.1	51.6	60.3	66.5	66.6
Heavy Trucks:	63.1	59.8	56.4	61.0	67.2	67.3
Vehicle Noise:	70.3	68.5	66.5	65.2	72.2	72.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	77	166	357	770
CNEL:	81	174	374	807

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Country Club Dr.
Road Segment: e/o Bob Hope Dr.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,570 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,310 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.23	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-16.01	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-19.97	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	69.3	68.0	62.0	70.4	71.0
Medium Trucks:	64.1	61.0	53.5	62.2	68.4	68.4
Heavy Trucks:	64.5	61.3	57.9	62.5	68.7	68.8
Vehicle Noise:	72.2	70.4	68.5	67.0	74.0	74.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	220	474	1,021
CNEL:	107	231	498	1,072

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Country Club Dr.
Road Segment: e/o John L. Sinn Rd.
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,570 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,310 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.23	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-16.01	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-19.97	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	69.3	68.0	62.0	70.4	71.0
Medium Trucks:	64.1	61.0	53.5	62.2	68.4	68.4
Heavy Trucks:	64.5	61.3	57.9	62.5	68.7	68.8
Vehicle Noise:	72.2	70.4	68.5	67.0	74.0	74.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	220	474	1,021
CNEL:	107	231	498	1,072

Tuesday, February 4, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: GPBO+P
Road Name: Country Club Dr.
Road Segment: e/o Vista Del Sol
Project Name: Hazelden Betty Ford Cent
Job Number: 12720

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,728 vehicles
Peak Hour Percentage:	8.38%
Peak Hour Volume:	2,324 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	55.0 feet
Centerline Dist. to Observer:	55.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	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:	47.000
Medium Trucks:	46.811
Heavy Trucks:	46.830

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.25	0.30	-1.20	-4.67	0.000	0.000
Medium Trucks:	81.00	-15.99	0.33	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-19.94	0.32	-1.20	-5.38	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.6	69.3	68.0	62.0	70.4	71.0
Medium Trucks:	64.1	61.0	53.5	62.3	68.4	68.5
Heavy Trucks:	64.6	61.3	57.9	62.5	68.7	68.8
Vehicle Noise:	72.3	70.5	68.5	67.0	74.1	74.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	221	476	1,025
CNEL:	108	232	499	1,076

Tuesday, February 4, 2020

APPENDIX 9.1:

CADNAA OPERATIONAL NOISE LEVEL CALCULATIONS

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12720

CadnaA Noise Prediction Model
12720_02.cna
Date:
08.02.20
Analyst:
B. Lawson

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Eve	Night	Day	Eve	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	49.8	49.8	41.2	55.0	50.0	45.0				5.00	a	6515936.20	2221578.98	5.00
R2		R2	48.6	48.6	43.0	55.0	50.0	45.0				5.00	a	6516852.37	2221158.87	5.00
R3		R3	44.2	44.2	34.8	55.0	50.0	45.0				5.00	a	6515696.83	2220682.82	5.00
R4		R4	40.5	40.5	34.1	55.0	50.0	45.0				5.00	a	6515434.52	2221411.04	5.00
R5		R5	39.2	39.2	35.5	55.0	50.0	45.0				5.00	a	6515387.25	2221630.76	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC01	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0				468.00	117.00	252.00	0.0	500	(none)	5.00	a	6516693.64	2221188.30	5.00
POINTSOURCE		AC02	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0				468.00	117.00	252.00	0.0	500	(none)	5.00	a	6516650.23	2221189.17	5.00
POINTSOURCE		AC03	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0				468.00	117.00	252.00	0.0	500	(none)	5.00	a	6516671.94	2221188.30	5.00
POINTSOURCE		AC04	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0				468.00	117.00	252.00	0.0	500	(none)	5.00	a	6515750.93	2221498.20	5.00
POINTSOURCE		AC05	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0				468.00	117.00	252.00	0.0	500	(none)	5.00	a	6515769.16	2221499.07	5.00
POINTSOURCE		AC06	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0				468.00	117.00	252.00	0.0	500	(none)	5.00	a	6515788.26	2221499.07	5.00
POINTSOURCE		AC07	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0				468.00	117.00	252.00	0.0	500	(none)	5.00	a	6515604.23	2220947.85	5.00
POINTSOURCE		AC08	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0				468.00	117.00	252.00	0.0	500	(none)	5.00	a	6515622.13	2220948.39	5.00
POINTSOURCE		AC09	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0				468.00	117.00	252.00	0.0	500	(none)	5.00	a	6515639.96	2220947.92	5.00
POINTSOURCE		COURT01	91.5	91.5	91.5	Lw	91.5		0.0	0.0	0.0				720.00	180.00	0.00	0.0	500	(none)	5.00	a	6516627.67	2221095.42	5.00
POINTSOURCE		COURT02	91.5	91.5	91.5	Lw	91.5		0.0	0.0	0.0				720.00	180.00	0.00	0.0	500	(none)	5.00	a	6515734.44	2221113.65	5.00
POINTSOURCE		COURT03	91.5	91.5	91.5	Lw	91.5		0.0	0.0	0.0				720.00	180.00	0.00	0.0	500	(none)	5.00	a	6515638.95	2221059.83	5.00
POINTSOURCE		COURT04	91.5	91.5	91.5	Lw	91.5		0.0	0.0	0.0				720.00	180.00	0.00	0.0	500	(none)	5.00	a	6515637.21	2221091.95	5.00
POINTSOURCE		COURT05	91.5	91.5	91.5	Lw	91.5		0.0	0.0	0.0				720.00	180.00	0.00	0.0	500	(none)	5.00	a	6515697.98	2221329.79	5.00
POINTSOURCE		COURT06	91.5	91.5	91.5	Lw	91.5		0.0	0.0	0.0				720.00	180.00	0.00	0.0	500	(none)	5.00	a	6515699.71	2221373.20	5.00

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Speed
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(mph)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
AREASOURCE		PARKING01	88.6	88.6	88.6	56.6	56.6	56.6	Lw	88.6		0.0	0.0	0.0							0.0	500	(none)			

Barrier(s)

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			
			left	right		horz.	vert.	Begin		End	
					(ft)	(ft)	(ft)	(ft)		(ft)	
BARRIERS		ACWALL01						8.00	a		
BARRIERS		ACWALL02						8.00	a		
BARRIERS		ACWALL03						8.00	a		
BARRIERS		WALL01						6.00	a		
BARRIERS		WALL02						6.00	a		

Building(s)

Name	M.	ID	RB	Residents	Absorption	Height	
						Begin	
						(ft)	
BUILDING		BUILDING00001	x	0		30.00	a
BUILDING		BUILDING00002	x	0		30.00	a
BUILDING		BUILDING00003	x	0		0.00	a

APPENDIX 10.1:

CADNAA CONSTRUCTION NOISE LEVEL CALCULATIONS

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12720

CadnaA Noise Prediction Model
12720_02_Demo.cna
Date:
09.02.20
Analyst:
B. Lawson

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Eve	Night	Day	Eve	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	60.4	60.4	60.4	55.0	50.0	45.0				5.00	a	6515936.20	2221578.98	5.00
R2		R2	52.1	52.1	52.1	55.0	50.0	45.0				5.00	a	6516852.37	2221158.87	5.00
R3		R3	60.5	60.5	60.5	55.0	50.0	45.0				5.00	a	6515696.83	2220682.82	5.00
R4		R4	62.1	62.1	62.1	55.0	50.0	45.0				5.00	a	6515434.52	2221411.04	5.00
R5		R5	58.6	58.6	58.6	55.0	50.0	45.0				5.00	a	6515387.25	2221630.76	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
DEMO		DEMO00001	102.9	102.9	102.9	71.9	71.9	71.9	Lw"	71.9		0.0	0.0	0.0							0.0	500	(none)			
DEMO		DEMO00002	103.6	103.6	103.6	71.9	71.9	71.9	Lw"	71.9		0.0	0.0	0.0							0.0	500	(none)			
DEMO		DEMO00003	102.8	102.8	102.8	71.9	71.9	71.9	Lw"	71.9		0.0	0.0	0.0							0.0	500	(none)			
DEMO		DEMO00004	102.7	102.7	102.7	71.9	71.9	71.9	Lw"	71.9		0.0	0.0	0.0							0.0	500	(none)			

12720

CadnaA Noise Prediction Model
12720_02_SitePrep.cna
Date:
09.02.20
Analyst:
B. Lawson

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Eve	Night	Day	Eve	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	65.6	65.6	65.6	55.0	50.0	45.0				5.00	a	6515936.20	2221578.98	5.00
R2		R2	74.5	74.5	74.5	55.0	50.0	45.0				5.00	a	6516852.37	2221158.87	5.00
R3		R3	63.6	63.6	63.6	55.0	50.0	45.0				5.00	a	6515696.83	2220682.82	5.00
R4		R4	61.9	61.9	61.9	55.0	50.0	45.0				5.00	a	6515434.52	2221411.04	5.00
R5		R5	61.2	61.2	61.2	55.0	50.0	45.0				5.00	a	6515387.25	2221630.76	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
SITEPREPARATION		SITEPREPARATION00002	119.4	119.4	119.4	75.3	75.3	75.3	Lw''	75.3		0.0	0.0	0.0							0.0	500	(none)			

12720

CadnaA Noise Prediction Model
12720_02_Grading.cna
Date:
09.02.20
Analyst:
B. Lawson

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Eve	Night	Day	Eve	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	63.8	63.8	63.8	55.0	50.0	45.0				5.00	a	6515936.20	2221578.98	5.00
R2		R2	72.7	72.7	72.7	55.0	50.0	45.0				5.00	a	6516852.37	2221158.87	5.00
R3		R3	61.8	61.8	61.8	55.0	50.0	45.0				5.00	a	6515696.83	2220682.82	5.00
R4		R4	60.1	60.1	60.1	55.0	50.0	45.0				5.00	a	6515434.52	2221411.04	5.00
R5		R5	59.4	59.4	59.4	55.0	50.0	45.0				5.00	a	6515387.25	2221630.76	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
SITEPREPARATION		SITEPREPARATION00002	117.6	117.6	117.6	73.5	73.5	73.5	Lw''	73.5		0.0	0.0	0.0							0.0	500	(none)			

12720

CadnaA Noise Prediction Model
12720_02_BuildingConstruction.cna
Date:
09.02.20
Analyst:
B. Lawson

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Eve	Night	Day	Eve	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	62.7	62.7	62.7	55.0	50.0	45.0				5.00	a	6515936.20	2221578.98	5.00
R2		R2	63.5	63.5	63.5	55.0	50.0	45.0				5.00	a	6516852.37	2221158.87	5.00
R3		R3	61.4	61.4	61.4	55.0	50.0	45.0				5.00	a	6515696.83	2220682.82	5.00
R4		R4	65.3	65.3	65.3	55.0	50.0	45.0				5.00	a	6515434.52	2221411.04	5.00
R5		R5	61.6	61.6	61.6	55.0	50.0	45.0				5.00	a	6515387.25	2221630.76	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00001	107.5	107.5	107.5	71.6	71.6	71.6	Lw"	71.6		0.0	0.0	0.0							0.0	500	(none)			
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00002	96.7	96.7	96.7	71.6	71.6	71.6	Lw"	71.6		0.0	0.0	0.0							0.0	500	(none)			
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00003	107.0	107.0	107.0	71.6	71.6	71.6	Lw"	71.6		0.0	0.0	0.0							0.0	500	(none)			
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00004	96.8	96.8	96.8	71.6	71.6	71.6	Lw"	71.6		0.0	0.0	0.0							0.0	500	(none)			
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00005	107.0	107.0	107.0	71.6	71.6	71.6	Lw"	71.6		0.0	0.0	0.0							0.0	500	(none)			
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00006	96.6	96.6	96.6	71.6	71.6	71.6	Lw"	71.6		0.0	0.0	0.0							0.0	500	(none)			

12720

CadnaA Noise Prediction Model
12720_02_Paving.cna
Date:
09.02.20
Analyst:
B. Lawson

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Eve	Night	Day	Eve	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	61.5	61.5	61.5	55.0	50.0	45.0				5.00	a	6515936.20	2221578.98	5.00
R2		R2	70.4	70.4	70.4	55.0	50.0	45.0				5.00	a	6516852.37	2221158.87	5.00
R3		R3	59.5	59.5	59.5	55.0	50.0	45.0				5.00	a	6515696.83	2220682.82	5.00
R4		R4	57.8	57.8	57.8	55.0	50.0	45.0				5.00	a	6515434.52	2221411.04	5.00
R5		R5	57.1	57.1	57.1	55.0	50.0	45.0				5.00	a	6515387.25	2221630.76	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
SITEPREPARATION		SITEPREPARATION00002	115.3	115.3	115.3	71.2	71.2	71.2	Lw''	71.2		0.0	0.0	0.0							0.0	500	(none)			

12720

CadnaA Noise Prediction Model
12720_02_ArchCoating.cna
Date:
09.02.20
Analyst:
B. Lawson

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Eve	Night	Day	Eve	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	56.3	56.3	56.3	55.0	50.0	45.0				5.00	a	6515936.20	2221578.98	5.00
R2		R2	57.1	57.1	57.1	55.0	50.0	45.0				5.00	a	6516852.37	2221158.87	5.00
R3		R3	55.0	55.0	55.0	55.0	50.0	45.0				5.00	a	6515696.83	2220682.82	5.00
R4		R4	58.9	58.9	58.9	55.0	50.0	45.0				5.00	a	6515434.52	2221411.04	5.00
R5		R5	55.2	55.2	55.2	55.0	50.0	45.0				5.00	a	6515387.25	2221630.76	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00001	101.1	101.1	101.1	65.2	65.2	65.2	Lw''	65.2		0.0	0.0	0.0							0.0	500	(none)			
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00002	90.3	90.3	90.3	65.2	65.2	65.2	Lw''	65.2		0.0	0.0	0.0							0.0	500	(none)			
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00003	100.6	100.6	100.6	65.2	65.2	65.2	Lw''	65.2		0.0	0.0	0.0							0.0	500	(none)			
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00004	90.4	90.4	90.4	65.2	65.2	65.2	Lw''	65.2		0.0	0.0	0.0							0.0	500	(none)			
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00005	100.6	100.6	100.6	65.2	65.2	65.2	Lw''	65.2		0.0	0.0	0.0							0.0	500	(none)			
BUILDINGCONSTRUCTION		BUILDINGCONSTRUCTION00006	90.2	90.2	90.2	65.2	65.2	65.2	Lw''	65.2		0.0	0.0	0.0							0.0	500	(none)			