Environmental Noise Assessment

South Whitney Mixed Use Project

City of Rocklin, California

Job # 2014-145

Prepared For:

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INTRODUCTION

The Proposed South Whitney Boulevard Mixed Use project is located adjacent to South Whitney Boulevard, and south of Sunset Boulevard in the City of Rocklin, California. The proposed project is directly adjacent to the existing QuikStop Gas Station at the northeast corner of the project site. Northwest of the proposed project is unimproved land across South Whitney Boulevard.

The project proposes the development of two lots on approximately 2.06 acres. Lot 1 consists of an 8,000 square feet of Medical Office including 40 parking stalls on approximately 1.18 acres. Lot 2 consists of 20 town homes including 10 visitor parking stalls on approximately 1.63 acres. Figure 1 shows an aerial photo of the project site and surrounding uses. Figure 2 shows the project site plan.

Traffic on South Whitney and Sunset Boulevards is a potential transportation noise source that could impact the proposed project site. In addition, the potential noise associated with the parking lot activities associated with the proposed Medical Office may be a potential noise source with may affect the project design. Predicted noise levels will be compared to the noise level standards of the City of Rocklin General Plan Noise Element. If necessary, noise control measures will be recommended for the proposed project.

ENVIRONMENTAL SETTING

BACKGROUND INFORMATION ON NOISE

Fundamentals of Acoustics

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

Figure 1

South Whitney Boulevard Mixed Use – City of Rocklin, California

Project Site and Traffic Noise Calibration Measurement Locations

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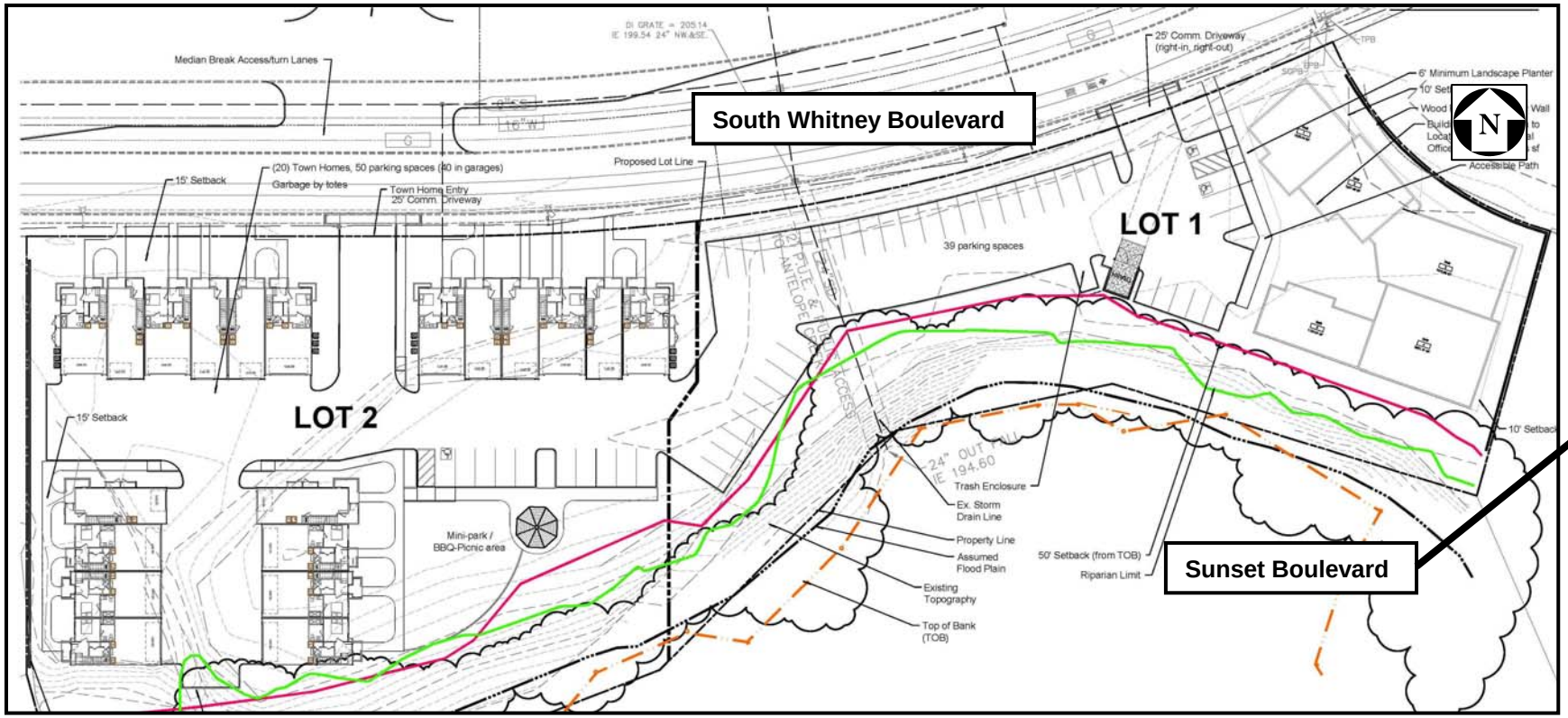
Figure 2
South Whitney Boulevard Mixed Use – City of Rocklin, California
Site Plan



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The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 1 lists several examples of the noise levels associated with common situations. Appendix A provides a summary of acoustical terms used in this report.

TABLE 1
TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. November, 2009.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and

dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

REGULATORY CONTEXT

City of Rocklin General Plan Noise Element

The City of Rocklin has a General Plan which includes a Noise Element. The General Plan Noise Element includes criteria for stationary noise sources. The proposed General Plan also establishes noise level criteria for transportation noise sources. Tables 2 and 3 show the proposed stationary and transportation noise source criteria, respectively from the General Plan (Tables 2-1 and 2-2 of the General Plan).

TABLE 2

EXTERIOR NOISE LEVEL DESIGN STANDARDS FOR NEW PROJECTS AFFECTED BY OR INCLUDING STATIONARY NOISE SOURCES

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly L_{eq}, dB	55 dBA	45 dBA

The City can impose noise level standards that are more restrictive than those specified above based upon determination of existing low ambient noise levels.

"Fixed" noise sources which are typically of concern include, but are not limited to the following:

HVAC Systems	Cooling Towers/Evaporative Condensers
Pump Stations	Lift Stations
Emergency Generators	Boilers
Steam Valves	Steam Turbines
Generators	Fans
Air Compressors	Heavy Equipment
Conveyor Systems	Transformers
Pile Drivers	Grinders
Drill Rigs	Gas or Diesel Motors
Welders	Cutting Equipment
Outdoor Speakers	Blowers

The types of uses which may typically produce the noise sources described above include but are not limited to: industrial facilities including pump stations, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields.

NOTE: The point of measurement for noise levels is at a location at least 5 feet inside the property line of the receiving land use and at a point 5 feet above ground level. In the case of lots where the noise-sensitive use has a reasonable outdoor activity area for outdoor enjoyment, the stationary noise source criteria can be applied at a designated outdoor activity area (at the discretion of the Community Development Director).

TABLE 3

MAXIMUM ALLOWABLE NOISE EXPOSURE

TRANSPORTATION NOISE SOURCES

Land Use	Outdoor Activity Areas[1] L_{dn}/CNEL, dB	Interior Spaces	
		L_{dn}/CNEL,dB	L_{eq}, dB[2]
Residential	60[3]	45	--
Transient Lodging	65[4]	45	--
Hospitals, Nursing Homes	60[3]	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Non-Commercial Places of Public Assembly	60[3]	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

[1]The outdoor activity area is generally considered to be the location where individuals may generally congregate for relaxation, or where individuals may require adequate speech intelligibility. Such places may include patios of residences, picnic facilities, or instructional areas.

Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.

At the discretion of the City, where no outdoor activity areas are provided or known, only the interior noise level criteria can be applied to the project.

[2]As determined for a typical worst-case hour during periods of use.

[3]Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

EVALUATION OF TRAFFIC NOISE LEVELS AT THE PROJECT SITE

Analysis of Exterior Traffic Noise Levels

j.c. brennan & associates, Inc. employs the Federal Highway Administration (FHWA) Traffic Noise Prediction Model (FHWA RD-77-108) for the prediction of traffic noise levels. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

On Thursday, May 1, 2014 j.c. brennan & associates, Inc., staff conducted short-term noise level measurements and concurrent counts of traffic on South Whitney and Sunset Boulevards.

The purpose of the short-term traffic noise level measurements was to determine the accuracy of the FHWA model in describing the existing noise environment on the project site, while accounting for existing site conditions such as intervening structures, actual travel speeds, and roadway grade. Noise measurement results were compared to the FHWA model results by entering the observed traffic volume, speed, and distance as inputs to the FHWA model. Figure 1 shows the noise measurement sites.

Instrumentation used for the measurement was a Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter which was calibrated in the field before use with an LDL CAL-200 acoustical calibrator. Table 3 shows the results of the traffic noise calibrations. Appendix B provides the complete inputs and results of the FHWA model calibration procedures.

TABLE 3
COMPARISON OF FHWA MODEL TO MEASURED TRAFFIC NOISE LEVELS

Vehicles/15 Minutes					Speed (mph)	Dist. (Feet)	Measured, L_{eq}	Modeled, L_{eq}*	Difference
Site	Time	Autos	Med. Trk.	Hvy.Trk.					
South Whitney Boulevard									
1	9:06 a.m.	57	2	0	40	81	55.9 dB	56.2 dB	-0.3 dB
Sunset Boulevard									
2	7:20 a.m.	297	7	1	35	220	53.9 dB	57.1 dB	-3.2 dB

* Acoustically "soft" site assumed
Source: j.c. brennan & associates, Inc. - 2014

Based upon the calibration results, the FHWA Model was found to accurately-predict South Whitney Boulevard traffic noise levels within 1 dB at the project site. Therefore, no offsets were added to the FHWA model for predicted future traffic noise levels on South Whitney Boulevard. However, the FHWA model was found to over predict traffic noise levels at Sunset Boulevard by +3.2 dB, this was due to partial exposure to Sunset Boulevard and intervening buildings. Therefore, a -3 dB correction will be applied to the prediction of future traffic noise levels of Sunset Boulevard, shown in Table 4

To determine the future traffic noise levels associated with Sunset Boulevard on the project site, j.c. brennan & associates, Inc., utilized Cumulative Plus Project traffic predictions prepared by Omni-Means, Ltd. Transportation consultants for the Whitney Townhomes Project (November, 2012).

Table 4 shows the predicted future traffic noise levels at the proposed residential buildings and outdoor activity areas located closest to roadways. A complete listing of the FHWA Traffic Noise Prediction Model inputs is provided in Appendix C.

TABLE 4
PREDICTED TRAFFIC NOISE LEVELS

Locations	Traffic Noise Levels, L_{dn}	Distance to 60 dB L_{dn} Traffic Noise Contour*
South Whitney Boulevard (Cumulative Plus Project)		
Common Outdoor Activity Area	57 dBA	80-feet
Nearest Residential Building Facade	61 dBA	80-feet
Nearest Office Building Facade	61 dBA	80-feet
Sunset Boulevard (Cumulative Plus Project)		
Common Outdoor Activity Area	53 dBA	422-feet
Nearest Residential Building Facade	54 dBA	422-feet
Nearest Office Building Facade	61 dBA	422-feet

Sources: j.c. brennan & associates, Inc - 2014
* Distance to noise contours is from the roadway centerline, or the median center.

The Table 4 data indicates that future traffic noise levels at the residential common outdoor activity area are predicted to comply with the exterior noise level standard of 60 dB Ldn.

Analysis of Interior Traffic Noise Levels:

Standard construction practices, consistent with the uniform building code typically provides an exterior-to-interior noise level reduction of approximately 25 dB, assuming that air conditioning is included for each unit, which allows residents to close windows for the required acoustical isolation. Therefore, as long as exterior noise levels at the building facades do not exceed 70 dB L_{dn}, the interior noise levels will typically comply with the interior noise level standard of 45 dB L_{dn}.

There are no residential facades which will be exposed to future exterior traffic noise levels exceeding 70 dB Ldn, or office facades which will be exposed to future exterior traffic noise levels exceeding 70 dB Leq. Therefore, no noise reduction measures appear to be warranted, assuming that air-conditioning is provided to allow windows to remain closed for acoustical isolation.

Analysis of Parking Lot Noise Levels

As a means of determining the noise levels due to parking lot activities, j.c. brennan & associates, Inc., utilized noise level data collected for previous parking lot studies, and will predict a conservative number of arrival and departures.

A typical SEL due to automobile arrivals/departures, including car doors slamming and people conversing is approximately 71 dB, at a distance of 50 feet and 63 dB L_{max} at 50 feet. Based upon the project design incorporating 40 parking spaces, j.c. brennan & associates, Inc., conservatively predicted a peak hour trip generation of 40 trips per hour. Parking lot noise levels were determined using the following formula.

Peak Hour Leq = SEL + 10log (N) -35.6, where:

The SEL is the mean sound exposure level (SEL) for an automobile arrival or departure, N is the number of parking related operations in a peak hour (N is 40), 35.6 is 10 times the logarithm of the number of seconds in the peak hour.

The property line of the nearest sensitive receiver is approximately 105 feet from the center of the proposed Medical Office parking lot. Using the equation above and the operations data described, the proposed parking lot would result in a peak hour noise level of 51.4 dB L_{eq} at a distance of 50 feet. At a distance of 105 feet, parking lot noise levels would be 45 dB Leq and 57 dB Lmax. Therefore, predicted parking lot noise is expected to comply with the City of Rocklin General Plan Noise Element daytime (7 a.m. to 10 p.m.) hourly noise level criterion of 55 dB Leq and the nighttime (10 p.m. to 7 a.m.) hourly noise level criterion of 45 dB Leq.

CONCLUSIONS

The proposed project is predicted to comply with the City of Rocklin 60 dB Ldn and 45 dB Ldn exterior and interior noise level standards for residential uses. In addition, the project will comply with the City of Rocklin 45 dB Leq interior noise level standard of office uses. Parking lot activities will comply with the City of Rocklin stationary noise source criteria at the residential portion of the project site. The following design features should be included in the project design:

1. Air-conditioning or mechanical ventilation needs to be provided to allow windows to remain closed for acoustical isolation.

Appendix A
Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
$L_{(n)}$	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L_{50} is the sound level exceeded 50% of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
NRC	Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the “Maximum” level, which is the highest RMS level.
RT_{60}	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.
SEL	Sound Exposure Level. SEL is s rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.
STC	Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

Appendix B

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Calibration Worksheet

Project Information:	Job Number:	2014-145
	Project Name:	South Whitney Blvd - Mixed Use
	Roadway Tested:	South Whitney Boulevard
	Test Location:	Site 1 - Southwest Corner on Project Site
	Test Date:	May 1, 2014
Weather Conditions:	Temperature (Fahrenheit):	75
	Relative Humidity:	Dry
	Wind Speed and Direction:	0-5 from Southwest
	Cloud Cover:	Clear
Sound Level Meter:	Sound Level Meter:	LDL Model 820
	Calibrator:	LDL Model CA200
	Meter Calibrated:	Immediately before and after test
	Meter Settings:	A-weighted, slow response
Microphone:	Microphone Location:	On Project Site
	Distance to Centerline (feet):	81
	Microphone Height:	5 feet above ground
	Intervening Ground (Hard or Soft):	**Soft**
	Elevation Relative to Road (feet):	5
Roadway Condition:	Pavement Type	Asphalt
	Pavement Condition:	Good
	Number of Lanes:	2
	Posted Maximum Speed (mph):	30
Test Parameters:	Test Time:	9:06 AM
	Test Duration (minutes):	15
	Observed Number Automobiles:	57
	Observed Number Medium Trucks:	2
	Observed Number Heavy Trucks:	0
	Observed Average Speed (mph):	40
Model Calibration:	Measured Average Level (L_{eq}):	55.9
	Level Predicted by FHWA Model:	56.2
	Difference:	***0.3 dB***

Conclusions:

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Appendix B

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Calibration Worksheet

Project Information:	Job Number:	2014-145
	Project Name:	South Whitney Blvd - Mixed Use
	Roadway Tested:	Sunset Boulevard
	Test Location:	Site 2 - Northeast Corner on Project Site
	Test Date:	June 4, 2014
Weather Conditions:	Temperature (Fahrenheit):	75
	Relative Humidity:	Dry
	Wind Speed and Direction:	0-5 from Southwest
	Cloud Cover:	Clear
Sound Level Meter:	Sound Level Meter:	LDL Model 820
	Calibrator:	LDL Model CA200
	Meter Calibrated:	Immediately before and after test
	Meter Settings:	A-weighted, slow response
Microphone:	Microphone Location:	On Project Site
	Distance to Centerline (feet):	220
	Microphone Height:	5 feet above ground
	Intervening Ground (Hard or Soft):	**soft**
	Elevation Relative to Road (feet):	5
Roadway Condition:	Pavement Type	Asphalt
	Pavement Condition:	Good
	Number of Lanes:	2
	Posted Maximum Speed (mph):	40
Test Parameters:	Test Time:	7:20 AM
	Test Duration (minutes):	10
	Observed Number Automobiles:	297
	Observed Number Medium Trucks:	7
	Observed Number Heavy Trucks:	1
	Observed Average Speed (mph):	35
Model Calibration:	Measured Average Level (L_{eq}):	53.9
	Level Predicted by FHWA Model:	57.1
	Difference:	***3.2 dB***

Conclusions:

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Appendix C

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2014- 145 South Whitney Blvd. Mixed Use
Description: Cumulative + Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	South Whitney Blvd	Outdoor Activity Area	11,460	87		13	2	0.5	30	125	
1	South Whitney Blvd	Building Façade Residential	11,460	87		13	2	0.5	30	65	
1	South Whitney Blvd	Building Façade Office	11,460	87		13	2	0.5	30	65	
2	Sunset Boulevard	Outdoor Activity Area	45,910	87		13	2	0.5	40	575	-3
2	Sunset Boulevard	Building Façade Residential	45,910	87		13	2	0.5	40	500	-3
2	Sunset Boulevard	Building Façade Office	45,910	87		13	2	0.5	40	180	-3

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Appendix C

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2014- 145 South Whitney Blvd. Mixed Use
Description: Cumulative + Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment	Autos	Medium Trucks	Heavy Trucks	Total
1	South Whitney Blvd	Outdoor Activity Area	55.2	48.9	50.0	57
1	South Whitney Blvd	Building Façade Residential	59.5	53.2	54.3	61
1	South Whitney Blvd	Building Façade Office	59.5	53.2	54.3	61
2	Sunset Boulevard	Outdoor Activity Area	51.9	44.0	42.8	53
2	Sunset Boulevard	Building Façade Residential	52.8	44.9	43.7	54
2	Sunset Boulevard	Building Façade Office	59.5	51.5	50.3	61

Appendix C

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2014- 145 South Whitney Blvd. Mixed Use
Description: Cumulative + Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment	75	70	65	60	55
1	South Whitney Blvd	Outdoor Activity Area	8	17	37	80	172
1	South Whitney Blvd	Building Façade Residential	8	17	37	80	172
1	South Whitney Blvd	Building Façade Office	8	17	37	80	172
2	Sunset Boulevard	Outdoor Activity Area	20	42	91	196	422
2	Sunset Boulevard	Building Façade Residential	20	42	91	196	422
2	Sunset Boulevard	Building Façade Office	20	42	91	196	422