

City of Etna 2024 General Plan Noise Element

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Prepared For:

City of Etna

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Table of Contents

Table of Contents.....	1
Introduction	2
Purpose of the Noise Element.....	2
Noise Element Requirements.....	3
Fundamentals of Noise	4
Existing & Future Noise Environments in Etna	7
Community Noise Survey	7
Roadway Noise	10
Parks & School Playgrounds Noise	10
Construction Noise	13
General Business and Light Industrial Use Noise	14
Summary of Existing and Projected Noise Conditions in Etna	14
Goals and Policies	15
Background on Criteria for Acceptable Noise Exposure	15
Noise Element Goals.....	16
Noise Element Policies.....	17
Traffic Noise	17
Fixed (Non-Transportation) Noise Sources	18
Transportation Projects & Criteria for Determining Significant Increases in Traffic Noise ...	21
General Noise Policies.....	21
Vibration	22
Exemptions.....	23
References	24

Introduction

The City of Etna (population 678) is a small community in southwestern Siskiyou County in Northern California along State Route 3 (SR 3) approximately 25 miles south of SR 3's intersection with Interstate 5 in Yreka. Because of Etna's rural setting and size, the City is unaffected by many of the noise-related issues typical of larger and more centrally located communities.

The City's current Noise Element was adopted in September 2005. Noise contours described in the existing Noise Element are based on a noise study completed in 2003 for an update of the County of Siskiyou's Noise Element, which the County ultimately did not adopt. This background report provides updated noise contours for Etna.

Purpose of the Noise Element

Noise is usually defined as unwanted or harmful sound that is unpleasant, loud, or disruptive. It has been increasingly recognized that excessive noise levels can have adverse health effects on people. As such, the purpose of a general plan noise element is to:

1. Provide sufficient information concerning the community's noise environment so that noise can be effectively considered in the land use planning process;
2. Develop strategies for reducing excessive noise exposure through cost-effective mitigation and/or zoning;
3. Protect "noise-sensitive" uses and areas of the city where noise levels are acceptable; and
4. Ensure compliance with the State Noise Insulation Standards.¹

There is a certain amount of background noise that is tolerable within a community. This is the result of human activities (e.g. traffic, other people's conversations, air conditioning, other machinery and other activities). This average background noise becomes intrusive somewhere in the upper 50 decibel² (dB) range. It is the intrusive noise with which the Noise Element is particularly concerned, although gradual increases in ambient noise resulting from urban development is also a concern.

¹ These standards require specified levels of outdoor to indoor noise reduction for new multifamily residential construction in areas where the outdoor noise exposure exceeds CNEL (or DNL) 60 dB.

² Definitions and acoustical terminology are provided in Appendix A of this report.

Noise Element Requirements

California Government Code Section 65302(f) defines the requirements of a general plan noise element, as follows:

1. A noise element which shall identify and appraise noise problems in the community. The noise element shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:
 - A. Highways and freeways.
 - B. Primary arterials and major local streets.
 - C. Passenger and freight on-line railroad operations and ground rapid transit systems.
 - D. Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engines test stands, and all other ground facilities and maintenance functions related to airport operation.
 - E. Local industrial plants, including but not limited to, railroad classification yards.
 - F. Other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment.
2. Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (A) to (F), inclusive.
3. The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.
4. The noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards.

Fundamentals of Noise

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and hence are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called Hertz (Hz).

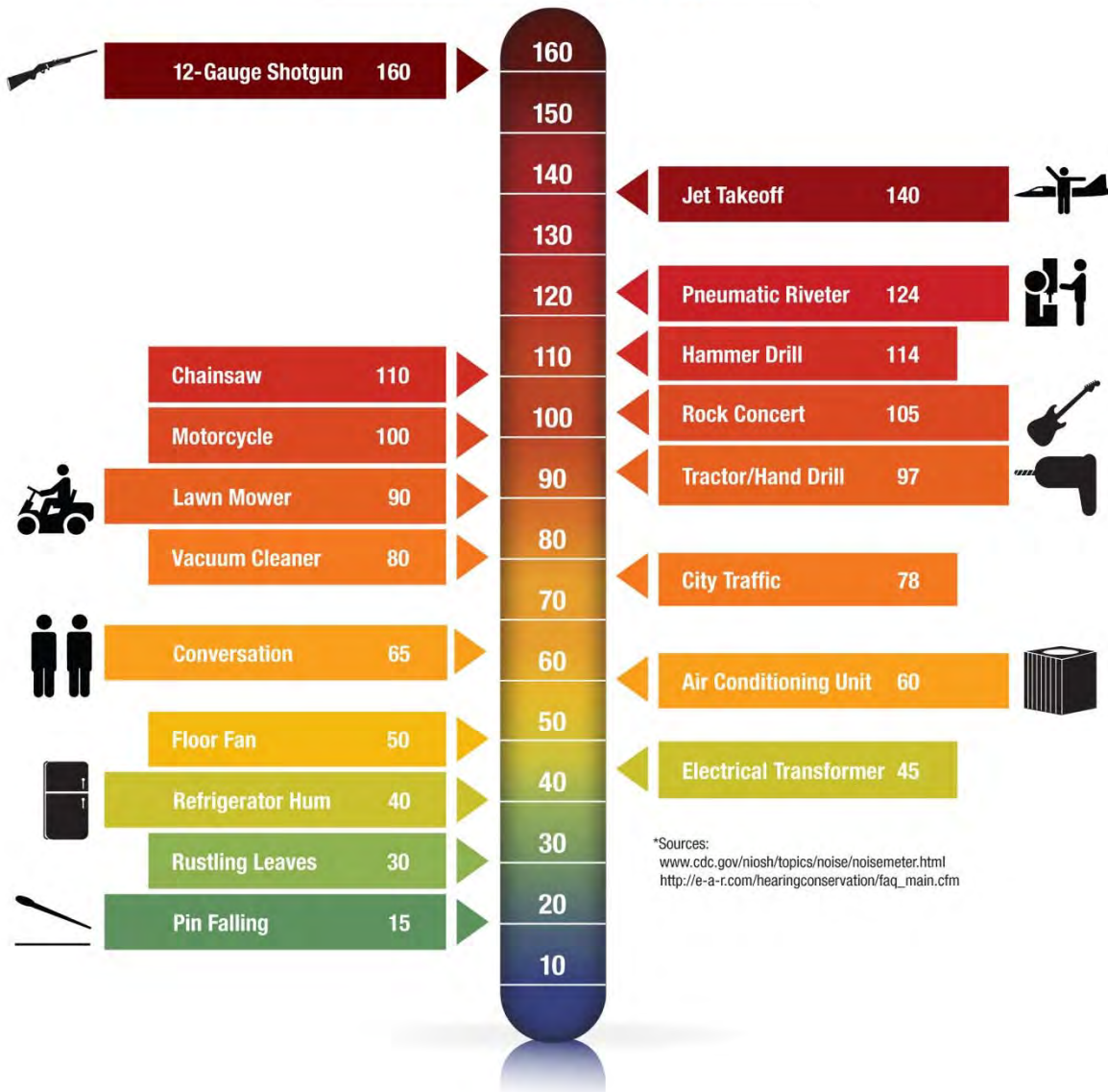
Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to the 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. Another useful aspect of the decibel scale is that changes in levels (dB) correspond closely to human perception of relative loudness. Figure 1 shows examples of noise levels for several common noise sources and environments.

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 weighing the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.

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 noise environment. A common statistical tool to measure the ambient noise level 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, DNL, and shows very good correlation with community response to noise.

The Day-Night Average Level (DNL) is based upon the average noise level over a 24-hour day, with a +10-decibel weighting 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 DNL represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Figure 1
Common Noise Sources and Associated Noise Levels
Decibel Scale (dBA)*



Noise in the community has often been cited as being a health problem, not in terms of actual physiological damages such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities such as sleep, speech, recreation and tasks demanding concentration or coordination. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases, and the acceptability of the environment for people decreases. This decrease in acceptability and the threat to public well-being are the bases for land use planning policies preventing exposures to excessive community noise levels.

To control noise from fixed sources which have developed from processes other than zoning or land use planning, many jurisdictions have adopted community noise control ordinances. Such ordinances are intended to abate noise nuisances and to control noise from existing sources. They may also be used as performance standards to judge the creation of a potential nuisance, or potential encroachment of sensitive uses upon noise-producing facilities. Community noise control ordinances are generally designed to resolve noise problems on a short-term basis (usually by means of hourly noise level criteria), rather than on the basis of 24-hour or annual cumulative noise exposures.

In addition to the A-weighted noise level, other factors should be considered in establishing criteria for noise-sensitive land uses. For example, sounds with noticeable tonal content such as whistles, horns, droning or high-pitched sounds may be more annoying than the A-weighted sound level alone suggests. Many noise standards apply a penalty, or correction, of 5 dBA to such sounds. The effects of unusual tonal content are generally more of a concern at nighttime, when residents may notice the sound in contrast to low levels of background noise.

Because many rural residential areas experience very low noise levels, residents may express concern about the loss of "peace and quiet" due to the introduction of a sound which was not audible previously. In very quiet environments, the introduction of virtually any change in local activities will cause an increase in noise levels. A change in noise level and the loss of "peace and quiet" is the inevitable result of land use or activity changes in such areas. Audibility of a new noise source and/or increases in noise levels within recognized acceptable limits are not usually considered to be significant noise impacts, but these concerns should be addressed and considered in the planning and environmental review processes.

Existing & Future Noise Environments in Etna

This document presents background information on the existing and projected future noise environments in Etna, California. The existing city limits and community noise survey locations are shown on Figure 2.

Because of Etna's size and rural setting, the City is largely unaffected by many of the noise-related issues typical of larger and more centrally located communities. The ambient noise environment in Etna is defined primarily by traffic noise from Highway 3 and city streets, and to a lesser extent by commercial activities and common neighborhood noises. Activities at local schools and parks also periodically affect the noise environment within Etna, but to a much more localized extent. Noise sources associated with construction and property maintenance also contributed to the noise environment, typically on an intermittent and fairly temporary basis.

As Etna grows, coupled with overall growth in the region, traffic volumes on local roadways will increase, resulting in higher traffic noise environments. Similarly, growth in tourism-related activities, and increased commercial activities in the City will all contribute to higher ambient noise levels over time.

This document presents background information on the various types of noise sources affecting the existing and future noise environments within Etna. This information will be used in the development of Noise Element Goals and Policies to ensure land use compatibility within the City moving forward.

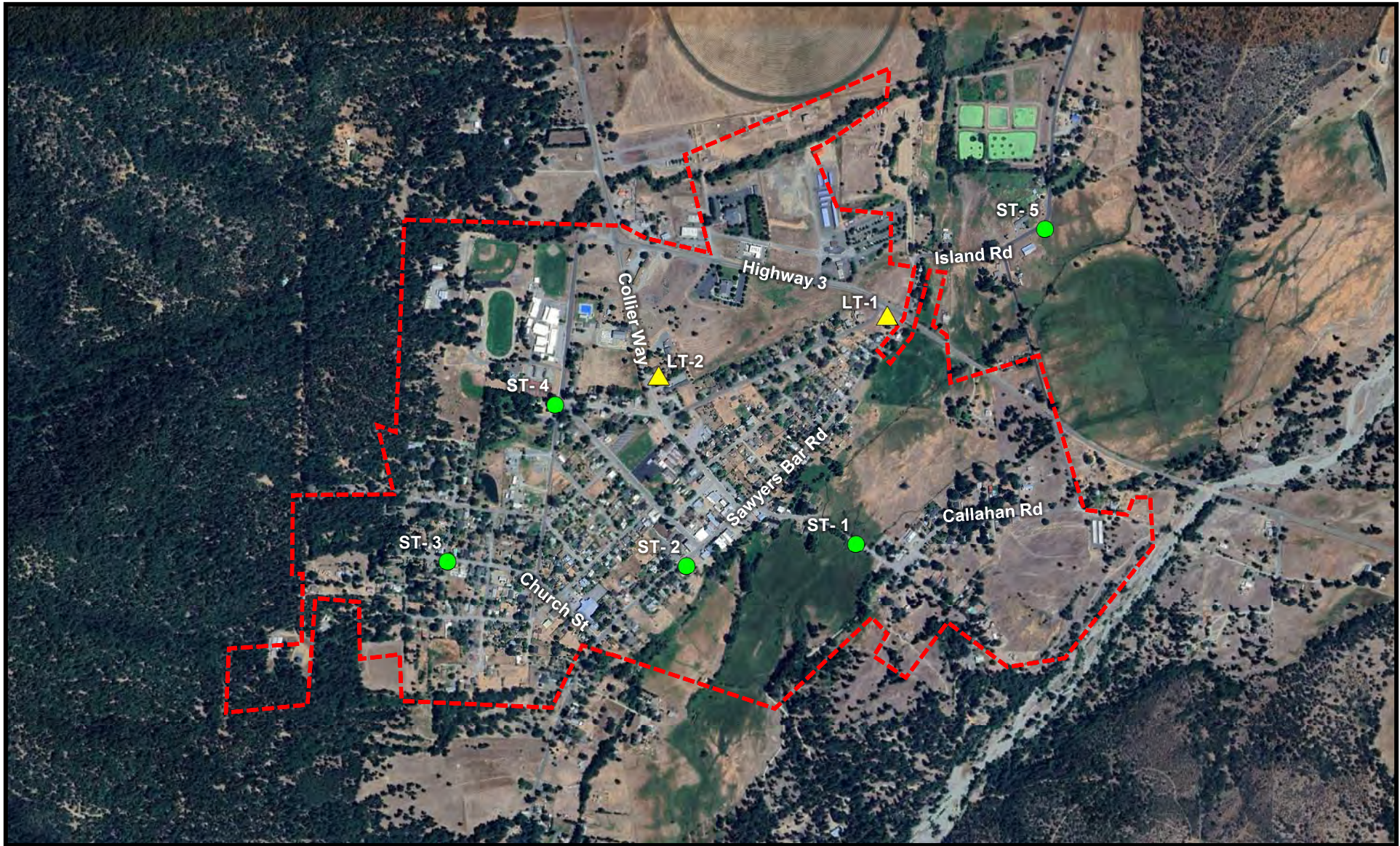
The following sections discuss the noise environment within Etna.

Community Noise Survey

To quantify existing noise levels within Etna, a community noise survey was performed. The community noise survey consisted of two 24-hour continuous noise measurement locations from Sunday, April 7th through Monday, April 8th, 2024. In addition to the long-term noise surveys, short-term surveys (15 minutes during daytime hours, 5 minutes during nighttime hours), were conducted during morning, afternoon, and evening hours at four locations within Etna between April 8th and 9th, 2024. The locations of the community noise measurement sites are shown on Figure 2.

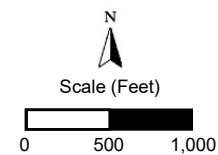
Larson-Davis Laboratories (LDL) precision integrating sound levels meters were used to complete the noise level measurement survey. The meters were calibrated before use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4). Photographs of the noise survey locations are provided in Appendix B.

Tables 1 and 2 contain summaries of the long-term and short-term noise survey results, respectively. The long-term noise survey results are presented in tabular form in Appendix C and graphical form in Appendix D.



Legend

- City Limits (Approximate)
- ▲ Long-Term Noise Measurement Locations
- Community Ambient Noise Survey Locations



Etna City Limits and Community
Noise Survey Locations
Etna GP Noise Element Update

Figure 2



Table 1
Long-term Community Noise Survey Results
Etna, CA.

Site ¹	Date	Day [dB]		Night [dB]		DNL [dB]
		Leq	Lmax	Leq	Lmax	
LT-1	Sunday, April 7, 2024	51	72	40	60	51
	Monday, April 8, 2024	53	72	47	66	55
	Average	52	72	44	63	53
LT-2	Monday, April 8, 2024	51	70	44	64	52
1. Noise monitoring locations are shown on Figure 2. Source: Bollard Acoustical Consultants, Inc (2024)						

Table 2
Short-term Community Noise Survey Results
Etna, CA.

Site ¹	Date	Time	Lmax	Leq	DNL (Est.) ²
ST-1	Tuesday, April 9, 2024	9:03 AM	66	47	52
	Monday, April 8, 2024	12:44 PM	73	51	
	Monday, April 8, 2024	10:14 PM	58	52	
ST-2	Tuesday, April 9, 2024	9:23 AM	75	57	56
	Monday, April 8, 2024	1:06 PM	75	56	
	Monday, April 8, 2024	10:25 PM	51	50	
ST-3	Tuesday, April 9, 2024	9:43 AM	73	58	50
	Monday, April 8, 2024	1:31 PM	67	47	
	Monday, April 8, 2024	10:43 PM	44	33	
St-4	Tuesday, April 9, 2024	10:02 AM	67	51	47
	Monday, April 8, 2024	1:50 PM	59	44	
	Monday, April 8, 2024	10:53 PM	43	34	
ST-5	Tuesday, April 9, 2024	10:29 AM	68	46	50
	Monday, April 8, 2024	2:13 PM	60	43	
	Monday, April 8, 2024	11:04 PM	47	41	
<div><div>1. Noise monitoring locations are shown on Figure 2.</div><div>2. DNL was estimated from the measured Leq values.</div></div> <div>Source: Bollard Acoustical Consultants, Inc (2024)</div>					

As indicated in Table 1, noise levels measured at Sites LT-1 and LT-2 ranged from 52-53 dB DNL. These noise levels were most heavily influenced by traffic on Highway 3 and distant traffic.

At the short-term noise monitoring sites, Table 2 indicates that measured average noise levels varied by location and time of day. Noise sources observed to have affected the daytime short-term noise survey results included local and distant traffic, generators, elementary school children playing, barking dogs, industry, and birds. Noise sources observed to have affected the nighttime short-term noise survey results included local and distant traffic, generators and frogs.

Overall, the community noise survey results indicate that the noise environment in Etna is fairly low. These results are as expected and will be used to develop appropriate noise policies for future development within Etna.

Roadway Noise

Highway 3 is the main source of traffic noise within Etna, although traffic on local surface streets also contributes to the overall ambient noise environment in town. The Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to predict existing and future traffic noise levels for this roadway. The FHWA Model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks.

Average Daily Traffic (ADT) volumes for existing (2022) conditions were obtained from published Caltrans traffic data. Future conditions were conservatively estimated by doubling the existing ADT volumes. The results of the traffic noise modelling process indicate that existing and future Highway 3 traffic noise levels are approximately 56 and 59 dB DNL at a reference distance of 100 feet. Figures 3 and 4 illustrate the existing and future traffic noise contours within the Noise Element Study Area. The complete FHWA Model results for the roadways are presented in Appendix E.

It is recognized that vehicle speeds, truck percentages, day/night distributions and topographic shielding vary on the roadways within Etna. As a result, it is not feasible to precisely predict existing and future traffic noise levels at the General Plan level. The noise contours shown on Figures 3 and 4 are useful for performing screening analyses to determine if more detailed noise analyses may be warranted for future noise-sensitive development projects.

Parks & School Playgrounds Noise

Children playing on school playgrounds, at neighborhood parks or even in yard areas of residential daycares can generate sound levels which could be considered by some to be objectionable. Typical noise levels associated with groups of children playing at a distance of 50 feet can range from 50 to 60 dB L_{eq} , with maximum noise levels ranging from 65 to 75 dB L_{max} . Actual noise generation will depend on the orientation and proximity of the play areas to the proposed sensitive uses, the number of children using the play areas at a given time, and the types of activities the children are engaged in.

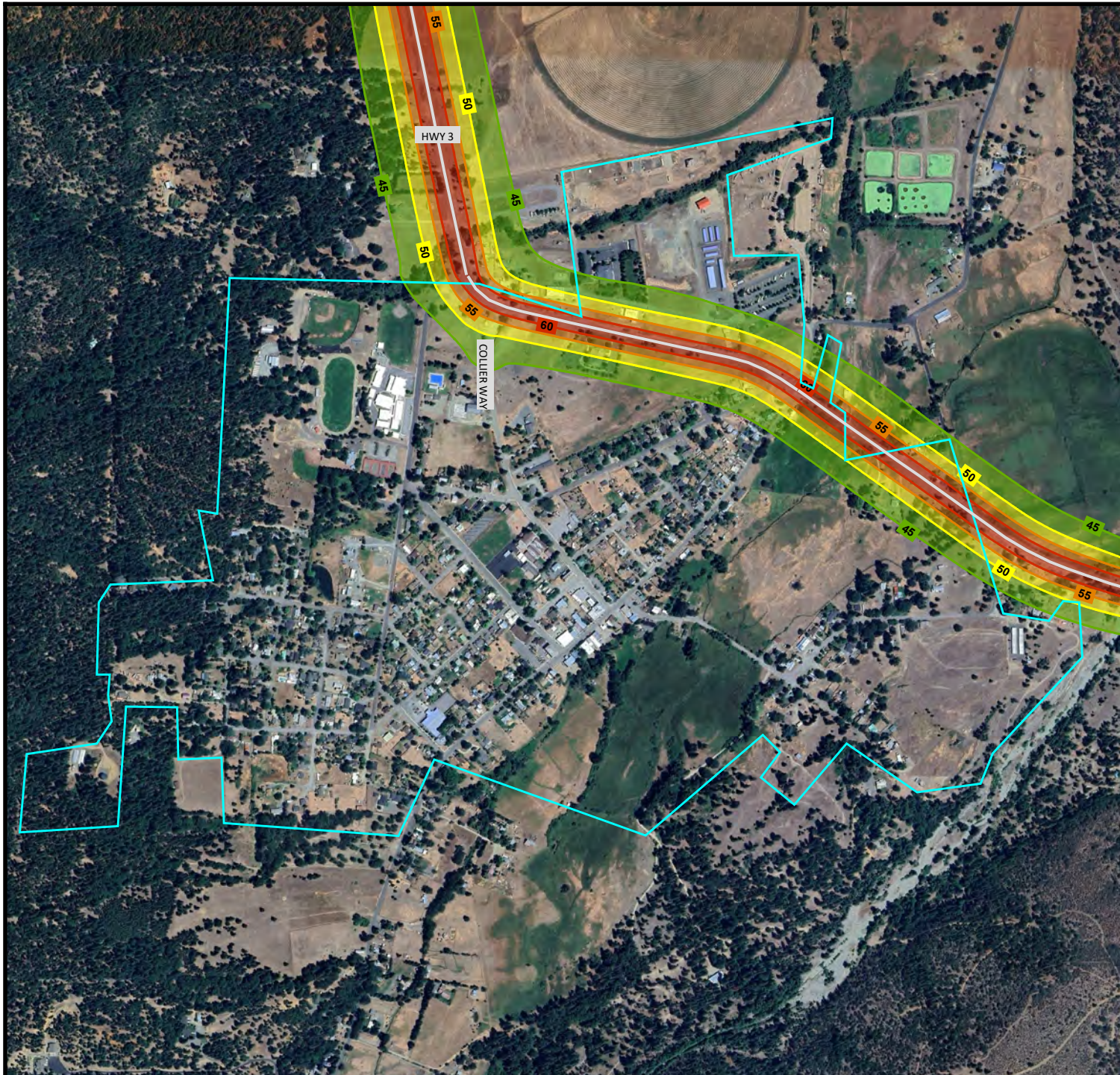


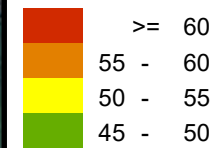
Figure 3

**Existing Noise
Contours**

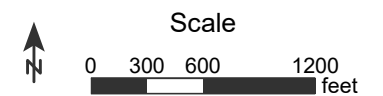
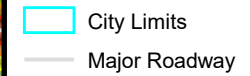
Etna GP
Noise Element Update

Legend

Contour Scale, Leq [dBA]



Objects



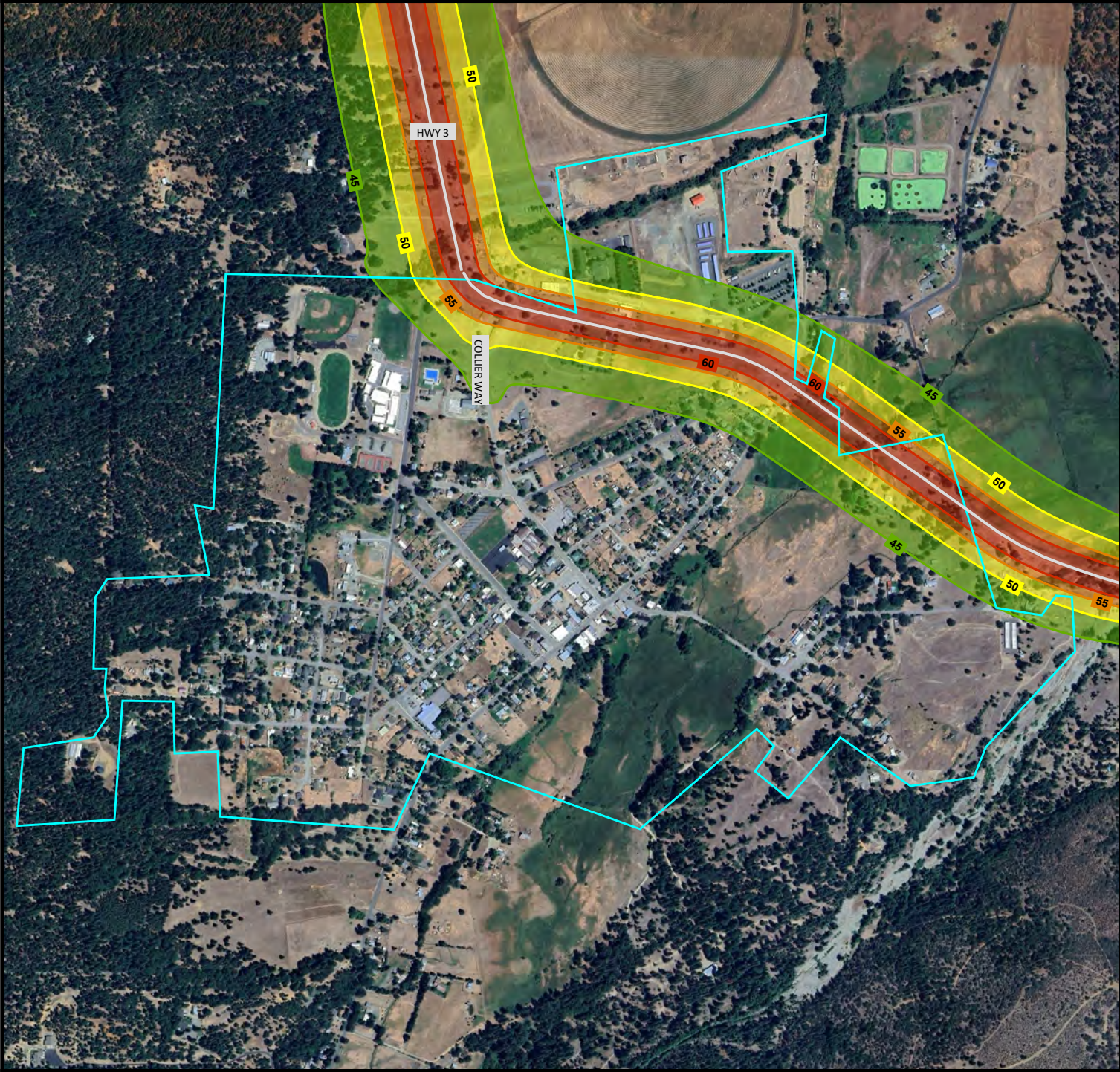






Figure 4

**Future Noise
Contours**



Etna GP
Noise Element Update

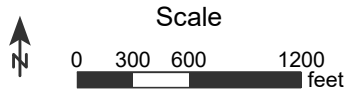
Legend

Contour Scale, Leq [dBA]

	>= 60
	55 - 60
	50 - 55
	45 - 50

Objects

-  City Limits
-  Major Roadway



Construction Noise

During the construction phases of projects, whether for new residential or commercial construction, or roadway improvement projects, noise from construction activities adds to the noise environment in the immediate project vicinity. Activities involved in typical construction would generate maximum noise levels, as indicated in Table 3, ranging from 76 to 90 dBA at a distance of 50 feet.

Table 3
Construction Equipment Reference Noise Levels

Equipment Description	Maximum Noise Level at 50 feet [dBA]
Air compressor	80
Backhoe	80
Ballast equalizer	82
Ballast tamper	83
Compactor	82
Concrete mixer	85
Concrete pump	82
Concrete vibrator	76
Crane, mobile	83
Dozer	85
Generator	82
Grader	85
Impact wrench	85
Loader	80
Paver	85
Pneumatic tool	85
Pump	77
Saw	76
Scarifier	83
Scraper	85
Shovel	82
Spike driver	77
Tie cutter	84
Tie handler	80
Tie inserter	85
Truck	84

Source: Federal Transit Administration Noise and Vibration Impact Assessment Manual, Table 7-1 (2018)

General Business and Light Industrial Use Noise

Existing or planned commercial/industrial operations may result in noise impacts when they are proposed near noise-sensitive land uses, or when noise-sensitive land uses are proposed near commercial or industrial noise sources.

Typical noise sources within Etna include, but are not limited to, the following:

- A. Concerts in the Park
- B. Stores & restaurants on Main Street
- C. Etna Elementary and High School playing fields
- D. Scott Valley Community Pool

The noise emissions of these types of uses are dependent on many factors, and are therefore, difficult to quantify precisely. Nonetheless, noise generated by these uses contribute to the ambient noise environment in the immediate vicinity of these uses, and should be considered where either new noise-sensitive uses are proposed nearby or where similar uses are proposed in existing residential or other noise-sensitive areas.

Summary of Existing and Projected Noise Conditions in Etna

In general, Etna is a fairly quiet city and significant increases in ambient noise levels within the City are not expected in the future, nor is substantial development of noise-generating or noise-sensitive land uses. Nonetheless, where new development is proposed, care should be taken by City Planning Department staff to identify areas of potential land-use incompatibility with respect to noise and apply the Noise Element policies accordingly.

Goals and Policies

Background on Criteria for Acceptable Noise Exposure

The State Office of Planning and Research (OPR) Noise Element Guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The OPR guidelines contain a land use compatibility table which describes the compatibility of different land uses with a range of environmental noise levels in terms of L_{dn}. A noise environment of 60 dB L_{dn} or less is considered to be normally acceptable for residential uses according to those guidelines.

The U.S. Environmental Protection Agency (EPA) also offers guidelines for community noise exposure in the publication “Information on the Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety”. These guidelines consider occupational noise exposure as well as noise exposure in the home. The “Levels Document” recognizes an exterior noise level of 55 dB L_{dn} as a goal to protect the public from hearing loss, activity interference, sleep disturbance and annoyance. The EPA notes, however, that this level is not a regulatory goal, but is a level defined by a negotiated scientific consensus without concern for economic and technological feasibility or the needs and desires of any particular community. The EPA and other Federal agencies have suggested land use compatibility guidelines which indicate that residential noise exposures of 55 to 65 dB L_{dn} are acceptable.

The U.S. Environmental Protection Agency has also prepared a Model Community Noise Control Ordinance, using L_{eq} as the means of defining allowable residential noise level limits. The EPA model contains no specific recommendations for local noise level standards, but reports a range of L_{eq} values as adopted by various local jurisdictions. The mean daytime residential noise standard reported by the EPA is 57 dBA (L_{eq}), and the mean nighttime residential noise standard is 52 dBA (L_{eq}). Other state laws and regulations regarding noise control are directed towards aircraft, motor vehicles and noise in general.

The California Vehicle Code sets noise emission standards for new vehicles including autos, trucks, motorcycles and off-road vehicles. Performance standards also apply to all vehicles operated on public streets and roadways. Section 216 of the Streets and Highways Code regulates traffic noise received at schools near freeways.

Noise Element Goals

The Noise Element of the Etna General Plan provides a basis for comprehensive local policies to control and abate environmental noise and to protect the citizens of Etna and its economic base against land use incompatibilities. The specific goals of this Noise Element are as follows:

- Goal 1** To protect the existing and future citizens of Etna from the harmful effects of exposure to excessive noise.
- Goal 2** To protect existing noise-sensitive land uses from encroachment by new uses that would generate noise levels which are incompatible with those uses, and to discourage new noise-sensitive land uses from being developed near sources of high noise levels.
- Goal 3** To recognize that noise is an inherent by-product of many land uses and to protect the economic base of Etna by preventing the encroachment of noise-sensitive land uses into areas affected by existing noise-producing uses.
- Goal 4** To provide sufficient information regarding the community noise environment so that existing and potential future noise impacts may be effectively addressed in the land use planning and project review processes.
- Goal 5** To develop strategies for abating excessive noise exposure through appropriate mitigation measures in combination with appropriate zoning to avoid incompatible land uses.

Noise Element Policies

Traffic Noise

The following policies shall apply to new development proposals within the City of Etna which are affected by traffic noise. These standards do not apply to existing noise-sensitive land uses which are currently exposed to traffic noise.

- Policy 1** The noise level standards for noise-sensitive areas of new uses affected by traffic noise sources in Etna are shown by Table 4.
- Policy 2** Where the noise level standards of Table 4 are predicted to be exceeded at new uses proposed within Etna which are affected by traffic noise, appropriate noise mitigation measures shall be included in the project design to reduce projected noise levels to a state of compliance with the Table 4 standards at the noise-sensitive areas of the proposed uses.
- Policy 3** The City shall encourage local law-enforcement agencies to enforce the vehicle noise level limits specified within the California Motor Vehicle Code.

Table 4
Noise Standards for New Uses Affected by Transportation Noise Sources
Etna Noise Element

Land Use	Noise Sensitive ¹ Outdoor Area – DNL ⁶	Noise Sensitive Interior Spaces ^{2,3}	
		DNL ⁶	Leq ^{4,7}
Residential	65	45	---
Mixed Use Residential	---	45	---
Transient Lodging, Hospitals ³ & Nursing Homes	65	45	---
Theaters & Auditoriums	---	---	35
Churches, Meeting Halls, Libraries	65	---	40
Schools ⁵	---	---	40
Office/Professional	65	---	45
Commercial/Retail Buildings	---	---	50
Playgrounds, Parks, etc.	70	---	---
Industrial	---	---	50

Notes:

- Noise sensitive areas are defined in the acoustic terminology section. Where there are no sensitive exterior spaces proposed as part of the new use, only the interior noise level standards shall apply.
- Interior noise level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed positions.
- Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.
- As determined for a typical worst-case hour during periods of use.
- Exterior areas of school uses are not typically noise-sensitive. As a result, the standards for schools are focused on the interior office and classroom spaces.
- DNL = Day – Night Average Level (also denoted L_{dn}). Represents 24-hour average of noise with noise occurring during nighttime hours (10 pm to 7 am) penalized by 10 dB prior to averaging.
- Leq = Average or “Equivalent” noise level. Represents the energy average of all noise occurring during a given period (typically 1-hour).

Fixed (Non-Transportation) Noise Sources

The following policies shall apply to new development proposals which are either affected by existing locally-regulated noise sources or proposed uses which would include noise sources which are regulated at the local level. Fixed noise sources do not include vehicles on public roadways but do include sources of noise originating from either a fixed or variable position on private property.

Policy 4 The interior and exterior noise level standards for noise-sensitive areas of new uses affected by existing fixed noise sources in Etna are shown by Table 5. Where the noise level standards of Table 5 are predicted to be exceeded at a proposed noise-sensitive areas due to existing fixed noise sources, appropriate noise mitigation measures shall be included in the project design to reduce projected noise levels to a state of compliance with the Table 5 standards within the identified noise-sensitive areas of the proposed new development.

- Policy 5** Where a project would result in the introduction of new fixed noise sources where such sources do not currently exist, the noise generation of those sources shall be mitigated so as not exceed the interior and exterior noise level standards of Table 5 at existing noise-sensitive areas in the project vicinity.
- Policy 6** If a noise-generating use is proposed adjacent to vacant lands currently zoned for uses which may be developed with exterior noise sensitivity, the noise generating use shall be responsible for mitigating its noise generation to a state of compliance with the Table 5 standards using reasonable assumptions pertaining to both the likely sensitivity of the receiving land use and the noise generation of the project. At such time as that noise-sensitivity is introduced on the nearby vacant parcel(s), the proposed noise-generating use will be responsible for complying with the City's Noise Ordinance standards
- Policy 7** Due to variations in types of both noise-generating and noise-sensitive land uses, as well as variations in ambient conditions in the City, the City shall have the ability to set noise standards which are up to 5 dB higher or lower than the Table 5 standards if determined appropriate by the City Council and/or City Planning department staff.

Table 5
Noise Standards for Locally Regulated (Non-Transportation) Noise Sources
Etna Noise Element

Receiving Land Use	Period ³	Exterior Areas ¹		Interior Spaces ²	
		Lmax ⁴	Leq ⁵	Lmax ⁴	Leq ⁵
Residential	Day Night	75 65	55 50	60 45	45 35
Mixed Use Residential	Day Night	-- --	-- --	60 45	45 35
Transient Lodging, Hospitals ⁶ & Nursing Homes	Day Night	75 70	60 55	60 45	45 35
Theaters & Auditoriums	Day Night	75 --	55 --	40 --	35 --
Churches, Meeting Halls, Libraries	Day Night	75 70	55 50	55 55	45 40
Schools ⁷	Day Night	-- --	-- --	55 55	40 40
Office/Professional	Day Night	80 --	60 --	60 --	45 --
Commercial/Retail Buildings	Day Night	80 --	60 --	60 --	50 --
Playgrounds, Parks, etc.	Day Night	75 --	60 --	-- --	-- --
Industrial	Day Night	80 --	60 --	60 --	50 --

Specific Notes:

1. Noise sensitive areas are defined acoustic terminology section.
2. Interior noise level standards are applied within noise-sensitive areas of the various land uses, as defined in the acoustic terminology section, with windows and doors closed.
3. Daytime hours = 7 am – 10 pm, Nighttime hours = 10 pm – 7 am.
4. Lmax = Highest measured sound level occurring during a given interval of time (Typically 1 hour).
5. Leq = Average or "Equivalent" noise level during the worst-case hour in which the building is in use.
6. Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.
7. Exterior areas of school uses are not typically noise-sensitive. As a result, the standards for schools are focused on the interior office and classroom spaces.

General Notes Applicable to All Noise Standards and Land Uses:

- a. Where the noise source in question consists of speech or music, or is impulsive in nature, or contains a pure tone, the noise standards of this table are reduced by 5 dB.
- b. Where ambient noise levels exceed the noise level standards shown above, the noise standards shall be increased in 5 dB increments to encompass the ambient.
- c. Reductions in the noise standards for noise sources identified in general note "A" above shall be applied after any increases warranted by elevated ambient conditions prescribed in general note "B", subject to verification through a noise study.

Transportation Projects & Criteria for Determining Significant Increases in Traffic Noise

Policy 8 For capacity enhancing roadway projects, the construction of new roadways, or projects which will substantially increase traffic on the local roadway network, a noise analysis shall be prepared. If pre-project traffic noise levels already exceed the noise standards of Table 4 and the increase is significant as defined below, noise mitigation measures should be considered to reduce traffic noise levels to a state of compliance with the Table 4 standards. A significant increase is defined as follows:

Pre-Project Noise Environment (DNL)	Significant Increase (dB)
Less than 60 dB	5+ dB
60 - 65 dB	3+ dB
Greater than 65 dB	1.5+ dB

Policy 9 If noise-reducing pavement is to be utilized in conjunction with a roadway improvement project, or if such paving exists adjacent to a proposed new noise-sensitive land use, the acoustical benefits of such pavement shall be included in the noise analysis prepared for the project.

General Noise Policies

Policy 10 All noise analyses prepared to determine compliance with the noise level standards contained within this Noise Element shall:

- A. Be the responsibility of the applicant.
- B. Be prepared by qualified persons experienced in the fields of environmental noise assessment and architectural acoustics.
- C. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.
- D. Estimate projected future (20 year) noise levels in terms of the Standards of Tables 4 and 5, and compare those levels to the adopted policies of the Noise Element.
- E. Recommend appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element.
- F. Estimate interior and exterior noise exposure after the prescribed mitigation measures have been implemented.

Policy 11 Noise analyses prepared for multi-family residential projects, townhomes, mixed-use, condominiums, or other residential projects where floor ceiling assemblies or party-walls shall be common to different owners/occupants, shall be consistent with the State of California Noise Insulation standards.

Policy 12 The City's General Plan Noise Element standards contained herein are applicable to proposed new uses. For resolving conflicts between existing uses, the City's Noise Ordinance shall be applicable.

Policy 13 Where exterior noise mitigation is required to achieve satisfaction with the noise standards of either Tables 4 or 5, the following priorities for mitigation shall be observed where feasible:

- A. Use of setbacks or open space buffers.
- B. Incorporate site planning to orient and/or shield sensitive exterior areas from view of the noise source in question.
- C. If the noise source is fixed, utilize quieter equipment or implement noise control treatments at the source.
- D. Solid walls should be considered a last resort for the mitigation of exterior noise levels and, if feasible, should be placed on earth berms to lessen their apparent height.

Policy 14 To provide a comprehensive approach to noise control, the City shall:

- A. Develop and employ procedures to ensure that noise mitigation measures required pursuant to an acoustical analysis are implemented in the project review process and, as may be determined necessary, through the building permit process.
- B. Develop and employ procedures to monitor compliance with the standards of the Noise Element after completion of projects where noise mitigation measures were required.
- C. The Noise Ordinance shall be amended to provide that noise standards contained therein will be consistent with the noise standards of this Noise Element.

Vibration

Policy 15 To reduce impacts from groundborne vibration, all proposals for new uses which would include vibration-generating activities, or for new sensitive uses proposed in proximity to existing sources of vibration shall comply with the vibration standards established by the Federal Transit Administration Transit Noise and Vibration Impact Assessment guidelines (FTA-VA-90-1003-06).

Policy 16 All projects that propose to use heavy construction equipment that has the potential to create vibrations that could cause structural damage to sensitive structures within 100 feet shall be required to submit a pre-construction vibration study prior to the approval of a building permit. Projects shall be required to incorporate specified measures and monitoring identified to reduce impacts. Pile driving or blasting are illustrative of the type of equipment that could be subject to this policy.

Exemptions

Policy 17 The following sources of noise shall be exempt from the provisions of this Noise Element:

- A. Emergency warning devices and equipment operated in conjunction with emergency situations, such as sirens and emergency generators which are activated during power outages. The routine testing of such warning devices and equipment, including generators, is also exempt provided such testing occurs during daytime hours.
- B. All activities occurring at public schools and public school playgrounds and sporting fields, as such activities are not regulated at the local level.
- C. Activities at private schools, parks or playgrounds, provided such activities occur during daytime hours (7 am – 10 pm).
- D. Activities associated with temporary events for which a permit has been obtained from the City (i.e., parades, fireworks displays, etc.)
- E. Construction and demolition activities located within 1,000 feet of noise-sensitive land uses provided they occur during normal daytime hours, excluding Sundays and Federal Holidays, subject to the conditions imposed by City permit. For construction activities, daytime hours are defined as 7 am to 7 pm. Construction activities occurring between the hours of 7 pm and 7 am must comply with the interior noise level standards identified in Table 2 unless an exception has been granted by the City Planning Department.
- F. Construction and demolition activities located beyond 1,000 feet of noise-sensitive land uses, subject to the conditions imposed by City permit. For construction activities, daytime hours are defined as 7 am to 7 pm.
- G. In the event of an emergency involving agricultural activities which requires prompt action to protect crops or equipment, the City can exempt noise generated by such action from the provisions of this Element.

References

1. General Plan Guidelines. State of California Office of Planning and Research (OPR). https://opr.ca.gov/docs/OPR_Appendix_D_final.pdf
2. United States Environmental Protection Agency (EPA). *Model Community Noise Control Ordinance, using L_{eq} as the means of defining allowable residential noise level limits.* <https://www.nonoise.org/library/epamodel/epamodel.pdf>
3. *California Vehicle Code.* https://california.public.law/codes/ca_sts_and_high_code_section_216
4. *Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-77-108).*
5. State of California Department of Transportation (Caltrans), Annual Traffic Counts. <https://dot.ca.gov/programs/traffic-operations/census/traffic-volumes>
6. FTA. 2018 (September) Federal Transit Administration Publication. *Transit Noise and Vibration Impact Assessment Manual.* https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

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.
IIC	Impact Insulation Class (IIC): A single-number representation of a floor/ceiling partition's impact generated noise insulation performance. The field-measured version of this number is the FIIC.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
Loudness	A subjective term for the sensation of the magnitude of sound.
Masking	The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.
Noise	Unwanted sound.
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.
RT₆₀	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
STC	Sound Transmission Class (STC): A single-number representation of a partition's noise insulation performance. This number is based on laboratory-measured, 16-band (1/3-octave) transmission loss (TL) data of the subject partition. The field-measured version of this number is the FSTC.





Legend

- A** Site LT-1 Facing North
- B** Site LT-1 Facing West
- C** Site LT-2 Facing West
- D** Site ST-1 Facing North

 Microphone Location

Noise Survey Photographs
City of Etna General Plan
Noise Element Update

Appendix B-1





Legend

- A** Site ST-2 Facing Northeast
- B** Site ST-3 Facing North
- C** Site ST-4 Facing East
- D** Site ST-5 Facing North

Noise Survey Photographs City of Etna General Plan Noise Element Update

Appendix B-2



Appendix C-1
Long-Term Ambient Noise Monitoring Results, LT-1
City of Etna General Plan Noise Element Update - Etna, California
Sunday, April 7, 2024

Hour	Leq	Lmax	L50	L90
12:00 AM	40	64	31	29
1:00 AM	38	61	31	28
2:00 AM	32	57	28	25
3:00 AM	29	40	28	26
4:00 AM	44	70	26	25
5:00 AM	42	65	27	26
6:00 AM	42	65	34	27
7:00 AM	43	65	39	35
8:00 AM	50	67	41	34
9:00 AM	54	80	43	35
10:00 AM	53	76	42	33
11:00 AM	49	70	40	31
12:00 PM	51	76	40	31
1:00 PM	50	69	39	31
2:00 PM	50	70	39	32
3:00 PM	51	75	41	33
4:00 PM	51	72	42	35
5:00 PM	52	75	43	35
6:00 PM	54	72	44	37
7:00 PM	51	70	41	34
8:00 PM	52	74	40	36
9:00 PM	44	65	38	36
10:00 PM	41	58	37	31
11:00 PM	40	63	33	31

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	54	43	51	44	29	40
Lmax (Maximum)	80	65	72	70	40	60
L50 (Median)	44	38	41	37	26	30
L90 (Background)	37	31	34	31	25	27

Computed DNL, dB	51
% Daytime Energy	95%
% Nighttime Energy	5%

GPS Coordinates
41°27'39.91"N
122°53'19.43"W

Appendix C-2
Long-Term Ambient Noise Monitoring Results, LT-1
City of Etna General Plan Noise Element Update - Etna, California
Monday, April 8, 2024

Hour	Leq	Lmax	L50	L90
12:00 AM	40	65	32	30
1:00 AM	35	56	31	29
2:00 AM	34	56	32	30
3:00 AM	47	77	30	28
4:00 AM	44	66	30	28
5:00 AM	49	70	36	31
6:00 AM	53	77	42	33
7:00 AM	55	71	47	39
8:00 AM	55	74	44	36
9:00 AM	53	75	41	33
10:00 AM	52	69	44	35
11:00 AM	53	69	44	36
12:00 PM	55	74	46	37
1:00 PM	52	71	41	33
2:00 PM	54	73	45	35
3:00 PM	54	75	46	37
4:00 PM	54	70	46	36
5:00 PM	55	80	46	36
6:00 PM	51	70	42	36
7:00 PM	51	76	42	35
8:00 PM	50	70	43	40
9:00 PM	46	64	43	40
10:00 PM	44	62	41	39
11:00 PM	43	63	40	36

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	55	46	53	53	34	47
Lmax (Maximum)	80	64	72	77	56	66
L50 (Median)	47	41	44	42	30	35
L90 (Background)	40	33	36	39	28	32

Computed DNL, dB	55
% Daytime Energy	88%
% Nighttime Energy	12%

GPS Coordinates
41°27'39.91"N
122°53'19.43"W

Appendix C-3
Long-Term Ambient Noise Monitoring Results, LT-2
City of Etna General Plan Noise Element Update - Etna, California
Monday, April 8, 2024

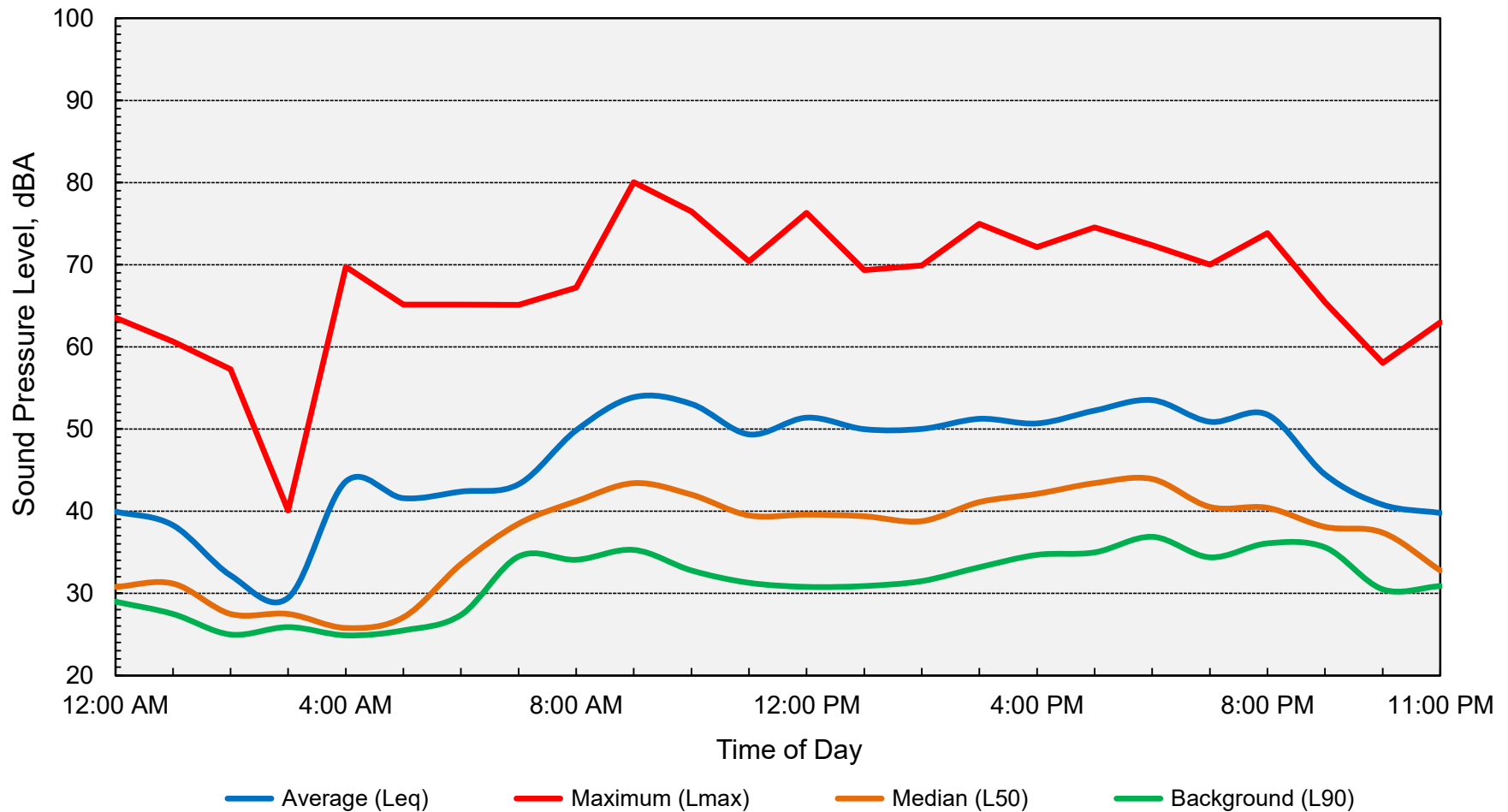
Hour	Leq	Lmax	L50	L90
12:00 AM	34	55	30	29
1:00 AM	33	45	29	28
2:00 AM	44	72	30	28
3:00 AM	41	66	29	28
4:00 AM	41	69	32	28
5:00 AM	47	68	36	31
6:00 AM	50	70	39	35
7:00 AM	53	71	44	40
8:00 AM	51	69	41	35
9:00 AM	52	75	40	36
10:00 AM	50	69	43	36
11:00 AM	49	69	42	37
12:00 PM	51	67	43	36
1:00 PM	50	69	41	35
2:00 PM	49	67	39	34
3:00 PM	52	75	42	36
4:00 PM	52	74	40	34
5:00 PM	52	70	42	35
6:00 PM	52	81	40	35
7:00 PM	47	70	37	33
8:00 PM	50	67	40	36
9:00 PM	44	63	36	32
10:00 PM	42	65	34	31
11:00 PM	38	64	33	30

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	53	44	51	50	33	44
Lmax (Maximum)	81	63	70	72	45	64
L50 (Median)	44	36	40	39	29	32
L90 (Background)	40	32	35	35	28	30

Computed DNL, dB	52
% Daytime Energy	89%
% Nighttime Energy	11%

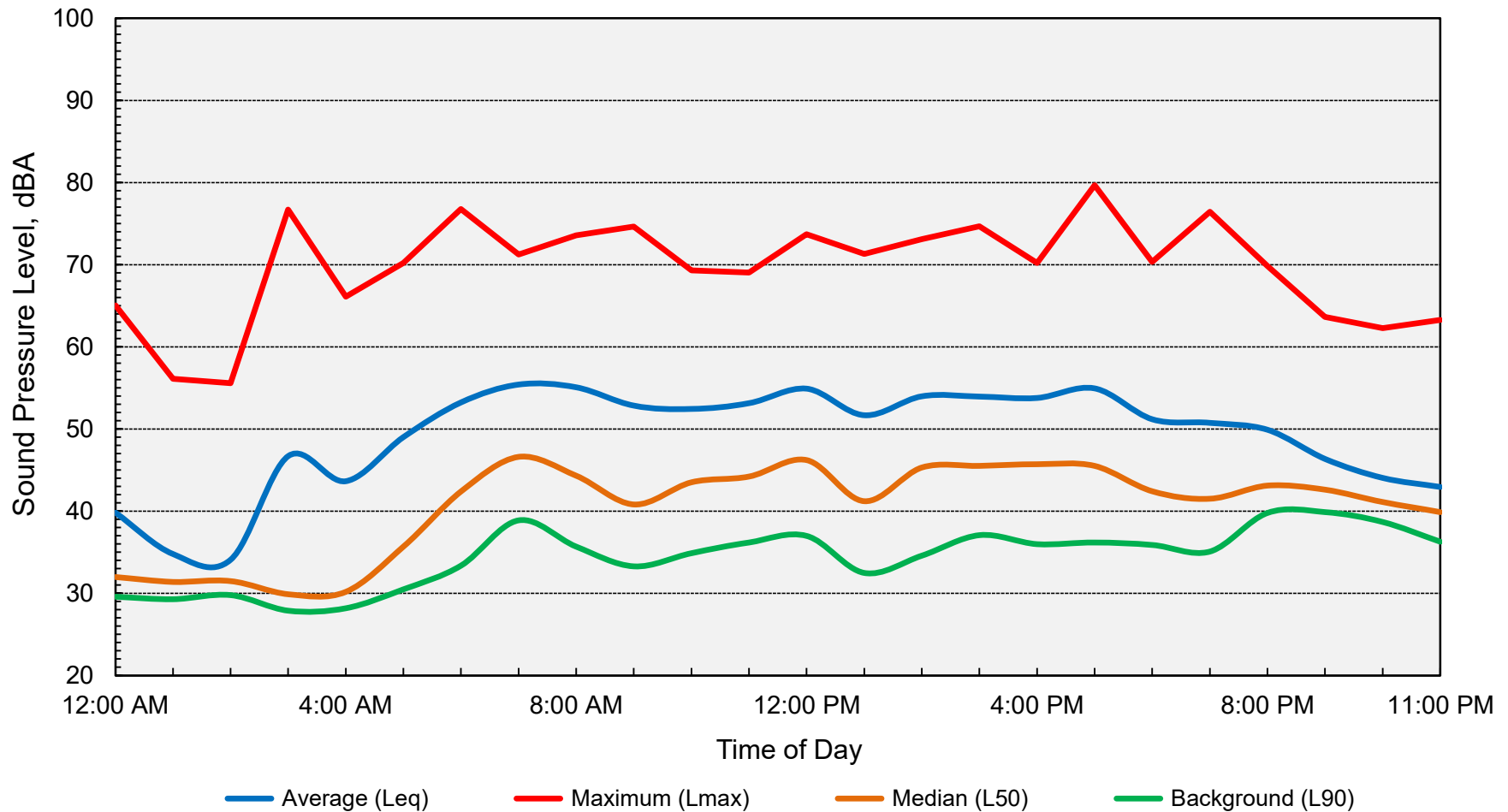
GPS Coordinates
41°27'35.14"N
122°53'44.09"W

Appendix D-1
Long-Term Ambient Noise Monitoring Results, LT-1
City of Etna General Plan Noise Element Update - Etna, California
Sunday, April 7, 2024



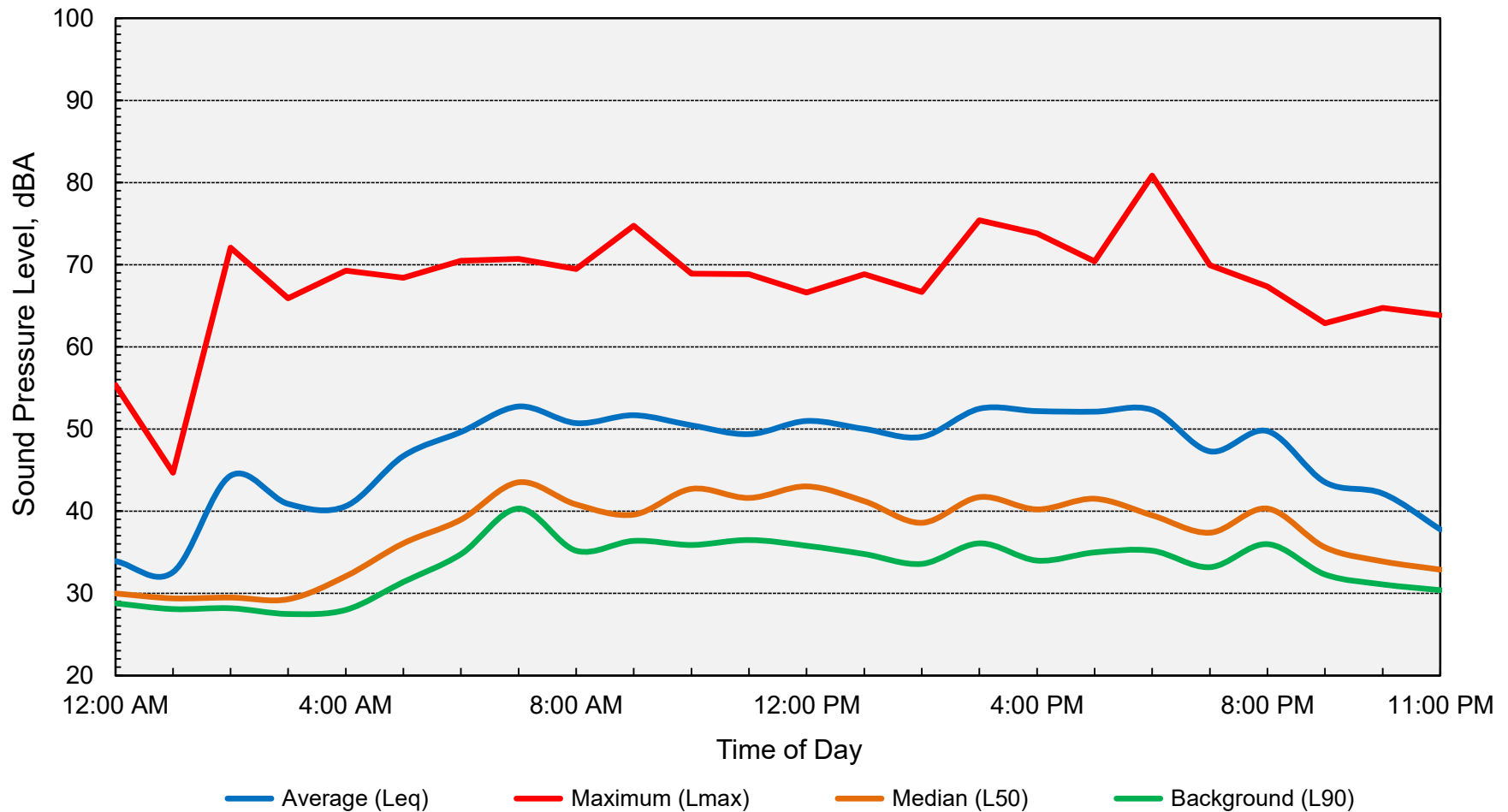
Computed DNL = 51 dB

Appendix D-2
Long-Term Ambient Noise Monitoring Results, LT-1
City of Etna General Plan Noise Element Update - Etna, California
Monday, April 8, 2024



Computed DNL = 55 dB

Appendix D-3
Long-Term Ambient Noise Monitoring Results, LT-2
City of Etna General Plan Noise Element Update - Etna, California
Monday, April 8, 2024



Computed DNL = 52 dB

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

Project Information:

Job Number: 2024-042
Project Name: Etna GP Noise Element Update
Roadway Name: Highway 3

Traffic Data:

Year: Future
Average Daily Traffic Volume: 2,800
Percent Daytime Traffic: 92
Percent Nighttime Traffic: 9
Percent Medium Trucks (2 axle): 5.8
Percent Heavy Trucks (3+ axle): 4.1
Assumed Vehicle Speed (mph): 50
Intervening Ground Type (hard/soft): **Soft**

Traffic Noise Levels:

				----- DNL (dB) -----			
Receiver	Description	Distance	Offset (dB)	Autos	Medium Trucks	Heavy Trucks	Total
Generic	Reference distance of 100 feet	100		56	51	54	59

Traffic Noise Contours (No Calibration Offset):

DNI Contour (dB)	Distance from Centerline (ft)
75	8
70	18
65	39
60	84

Notes: 1. Future ADT volume derived by increasing existing (2022) Caltrans traffic counts by a factor of 2