4.11 NOISE

This section includes a description of ambient noise conditions, a summary of applicable regulations related to noise and vibration, and an analysis of the impacts resulting from the implementation of the Amador County 2030 General Plan update (Draft General Plan).

4.11.1 REGULATORY SETTING

Various private and public agencies have established noise guidelines and standards to protect citizens from potential hearing damage and other adverse physiological and social effects associated with noise. Noise descriptors and applicable standards and guidelines are described below.

Noise Descriptors

The selection of a proper noise descriptor for a specific source is dependent upon the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise are defined below (Caltrans 2009:2-52).

- L_{max} (Maximum Noise Level): The maximum instantaneous noise level during a specific period of time. The L_{max} may also be referred to as the peak (noise) level.
- L_{min} (Minimum Noise Level): The minimum instantaneous noise level during a specific period of time.
- L_X (Statistical Descriptor): The noise level exceeded X% of a specific period of time. For example, L_{50} represents the noise level exceeded 50% of the time.
- L_{eq} (Equivalent Noise Level): The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq}. In noise environments determined by major noise events, such as aircraft overflights, the L_{eq} value is heavily influenced by the magnitude and number of single events that produce the high noise levels.
- L_{dn} (Day-Night Level): The energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.
- CNEL (Community Noise Equivalent Level): The CNEL is similar to the L_{dn} described above, but with an additional 5 dBA 'penalty' added to noise events that occur during the noise-sensitive hours between 7:00 p.m. to 10:00 p.m., which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the reported CNEL is typically approximately 0.5 dBA higher than the L_{dn}.

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 descriptors such as L_{dn} and CNEL, as defined above, and shows very good correlation with community response to noise.

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

There are no federal plans, policies, regulations, or laws that directly pertain to the County's consideration or adoption of the 2030 General Plan. However, various federal agencies have published methods and criteria related to noise assessment, some of which are incorporated into state and local requirements.

USEPA issued the Federal Noise Control Act (1972), which established programs and guidelines to identify and addressed the issue of noise as a threat to human health and welfare. USEPA determined that noise would be better addressed at the lower levels of government, and responsibilities for regulating noise control policies were transferred to state and local governments.

The Federal Transit Administration (FTA) has developed an extensive methodology and significance criteria to evaluate noise impacts attributable to surface transportation modes. These methods and criteria are presented in FTA's *Transit Noise Impact and Vibration Assessment* (FTA 2006). The FTA noise impact criteria are based on findings from studies of annoyance in communities affected by transportation noise.

Title 23 Part 772 of the Code of Federal Regulations (23 CFR 772) is the federal regulation governing traffic noise. The Federal Highway Administration (FHWA) has established noise assessment procedures and noise abatement criteria, Highway Traffic Noise: Analysis and Abatement Guidance (2011), along with development of noise models that are routinely used in impact assessment.

Aircraft operated in the U.S. are subject to federal requirements for noise emissions levels in Title 14 CFR, Part 36, which establishes maximum acceptable noise levels for specific aircraft types, taking into account the model year, aircraft weight, and number of engines. The Federal Aviation Administration (FAA) Part 150 program encourages airports to prepare noise exposure maps that show land uses that are incompatible with high noise levels (FICON 1992).

The Federal Railroad Noise Emission Compliance Regulation (49 C.F.R. Part 210) prescribes minimum compliance regulations for enforcement of the railroad noise emission standards adopted by USEPA The Federal Rail Administration (FRA) has adopted the FTA methodologies and significance criteria for the evaluation of noise impacts from surface transportation modes. State Plans, Policies, Regulations, and Laws

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Title 24 of the California Code of Regulations (CCR) establishes standards governing interior noise levels that apply to all new single-family and multi-family residential units in California. These standards require that acoustical studies be performed before construction at building locations where the existing L_{dn} exceeds 60 dBA. Such acoustical studies are required to establish mitigation measures that will limit maximum L_{dn} levels to 45 dBA in any habitable room. Although there are no generally applicable interior noise standards pertinent to all uses, many communities in California have adopted an L_{dn} of 45 as an upper limit on interior noise in all residential units.

In addition, the State of California General Plan Guidelines (State of California 2003: 250), published by the state Governor's Office of Planning and Research (OPR), provides guidance for the acceptability of projects within specific L_{dn} contours, and summarizes acceptable and unacceptable community noise exposure limits for various land use categories. Generally, residential uses are considered to be acceptable in areas where exterior noise levels do not exceed 60 dBA L_{dn}. Residential uses are normally unacceptable in areas exceeding 70 dBA and conditionally acceptable within 55 to 70 dBA L_{dn}. Schools are normally acceptable in areas up to 60 dBA L_{dn} and normally unacceptable in areas exceeding 70 dBA L_{dn}. Commercial uses are normally acceptable in areas up to 70 dBA L_{dn}. Between 65 and 80 dBA L_{dn}, commercial uses are conditionally acceptable, depending on the noise insulation features and the noise reduction requirements. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

Airport Land Use Compatibility Plans (ALUCP) (Public Utilities Code, §21670, et seq.) promote compatibility between public use and military airports and the land uses that surround them to the extent that these areas are not already devoted to incompatible land uses. The Airport Land Use Commission (ALUC) is tasked with creating or updating ALUCPs for the region's public-use and military airports in accordance with applicable state and federal laws.

LOCAL REGULATIONS

Regulations governing noise levels are typically implemented through local ordinances, based on General Plan Noise Element goals and policies. The Amador County Municipal Code does not include ordinances specifically related to noise; however, the Noise Element of the Amador County General Plan provides policies and implementation measures to control noise. The existing Amador County General Plan (1988) Noise Element would no longer be in effect and therefore not applicable following adoption of the Draft General Plan; therefore, noise standards of the Draft General Plan Noise Element are discussed in the following section.

Amador County Draft General Plan, Noise Element

Land Use Compatibility

Noise standards for compatible land uses are summarized in Table 4.11-1 (Table N-3 of the Draft General Plan).

Table 4.11-1
Land Use Compatibility for Community Noise Environments

Uses	CNEL (dBA)	
	Interior[1,2]	Exterior[3]
Active and passive agricultural operations	N/A	75
Single-family and duplex	45	60
Mobile home park	N/A	60
Multiple-family	45	65
Mixed-Use	45	70
Transient lodging—motels, hotels	45	65
Sports arenas, outdoor spectator sports	N/A	N/A[5]
Auditoriums, concert halls, amphitheaters	45	N/A[5]
Office buildings, business, commercial and professional	N/A	70
Manufacturing, utilities, processing, distribution, storage	N/A	75
Schools, nursing homes, day care facilities, hospitals, convalescent facilities, dormitories	45	65
Government Facilities—offices, fire stations, community buildings	45	N/A
Places of Worship, Churches	45	N/A
Libraries	45	N/A
Playgrounds, neighborhood parks	N/A	70
Utilities	N/A	75
Cemeteries	N/A	75
Mining, managed forestry	N/A	75
Passive Recreation	N/A	75
Golf courses, riding stables, water recreation, cemeteries	N/A	N/A

Notes: N/A = Not Applicable to specified land use category

[1] Interior habitable environment excludes bathrooms, closets and corridors.

[2] Interior noise standards shall be satisfied with windows in the closed position. Mechanical ventilation shall be provided per Uniform Building Code (UBC) requirements.

[3] Exterior noise level standard to be applied at outdoor activity areas. Where the location of an outdoor activity area is unknown or not applicable, the noise standard shall be applied inside the property plane of the receiving land use.

[4] Within the Town Center, Regional Service Center, and SPA land use designations, exterior space standards apply only to common outdoor recreational areas.

[5] Mitigation will be determined on an as-needed basis and to achieve interior noise standards and noise standards of adjacent uses.

Source: AECOM 2012

As shown in Table 4.11-1, exterior noise levels for single-family and multi-family residential are not to exceed 60 and 65 dBA CNEL exterior, respectively, with interior noise levels not to exceed 45 dBA CNEL (with windows closed).

Stationary Noise Sources

Due to the potentially different characteristics of stationary source noise (e.g. HVAC, loading dock activities, etc.) from transportation-related noise, the County applies a second set of standards when planning and making development decisions to ensure stationary noise sources do not adversely affect noise-sensitive land uses. These hourly and maximum performance standards (expressed in L_{eq} and L_{max}) for stationary noise sources are designed to protect noise-sensitive land uses adjacent to stationary sources from excessive and continuous noise. Table 4.11-2 (Table N-4 of the Draft General Plan Noise Element) summarizes County stationary source noise standards. These standards represent the acceptable exterior noise levels at the sensitive receptor's property line.

Table 4.11-2
Noise Level Performance Standards for Non-Transportation Noise Sources

Noise Level Descriptor	Daytime (7 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)
Hourly average level (L_{eq})	60 dBA	45 dBA
Maximum equivalent levels (L_{max})	75 dBA	65 dBA

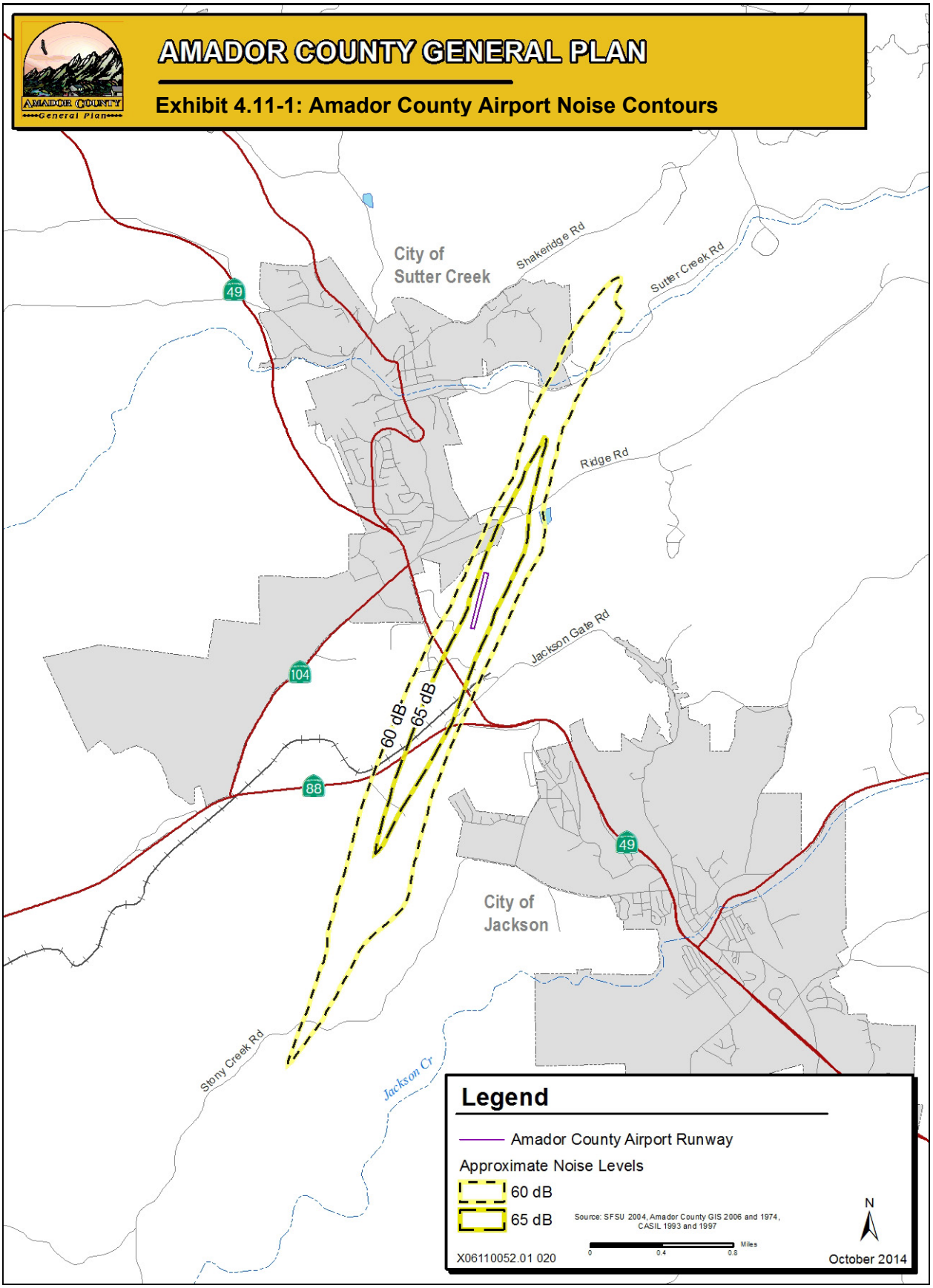
Note:
Each of the noise levels specified shall be lowered by 5 decibels for simple tone noises, noises consisting primarily of speech, or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). The noise standard is to be applied at the property lines of the affected land use.
Source: Amador County 2014.

Westover Field ALUP

The ALUP for Westover Field dated October 1987 (which meets state requirements for an ALUCP), was amended in July 1990 by the Amador County Airport Land Use Commission (ALUC). The plan provides a basis for determining which land uses which are compatible with airport operations. The ALUC is currently pursuing an update to the Westover Field ALUP.

The ALUP establishes a specific planning boundary map and comprehensive land use plan that defines compatible types and patterns for any future development that might occur in the area surrounding Westover Field Airport. The plan contains policies and guidelines to protect the public from the adverse effects of aircraft noise, to reduce the number of people exposed to airport-related hazards and to ensure that no structures affect navigable airspace (Amador County ALUC 1987).

The boundary for an airport noise area is determined by noise level contours developed according to noise standards for California airports as defined by California airports as defined by California Administrative Code, Title 21, Sections 5000 et seq., which uses the CNEL method to determine noise level contour locations. These state regulations establish as a general standard that single-family and multi-family dwellings, mobile homes and schools of standard construction are incompatible with noise levels above 65 CNEL. In addition, California Noise Insulation Standards (California Administrative Code, Title 25, Section 28) require acoustical analysis of residential structures, other than detached single-family dwellings, within a 60 CNEL noise contour. The noise contours are shown in Exhibit 4.11-1 (Figure N-3 of the Draft General Plan, and Figure 4 of the ALUP) Location Map – Approximate 60 dB and 65 dB airport Noise Level Contours.


AMADOR COUNTY GENERAL PLAN
Exhibit 4.11-1: Amador County Airport Noise Contours
City of Sutter Creek
Shakeridge Rd
Sutter Creek Rd
Ridge Rd
Jackson Gate Rd
49
104
88
60 dB
65 dB
City of Jackson
Stony Creek Rd
Jackson Cr
Legend
Amador County Airport Runway
Approximate Noise Levels
60 dB
65 dB
Source: SFSU 2004, Amador County GIS 2006 and 1974, CASIL 1993 and 1997
Miles
0
0.4
0.8
N
X06110052.01 020
October 2014

VIBRATION AND GROUNDBORNE NOISE IMPACT REGULATIONS

CEQA Appendix G indicates that excessive groundborne noise and vibration levels may be a significant impact; however, it does not define the term "excessive" vibration. Numerous public and private organizations and governing bodies have provided guidelines to assist in the analysis of groundborne noise and vibration; however, the federal, state, and local governments have yet to establish specific groundborne noise and vibration requirements. Additionally, there are no federal, state, or local vibration regulations or guidelines directly applicable to the proposed action.

Publications of the FTA and the California Department of Transportation (Caltrans) are two of the seminal works for the analysis of groundborne noise and vibration relating to transportation and construction-induced vibration. The proposed action is not subject to FTA or Caltrans regulations; however, these guidelines serve as a useful tool to evaluate vibration impacts. Therefore, for this analysis the FTA and Caltrans guidance outlined below is used to establish CEQA significance criteria. Caltrans guidelines recommend that a standard of 0.2 in/sec peak particle velocity (PPV) not be exceeded for the protection of normal residential buildings,[1] and that 0.08 in/sec PPV not be exceeded for the protection of old or historically significant structures (Caltrans 2004:17). With respect to human response within residential uses (i.e., annoyance, sleep disruption), FTA recommends a maximum acceptable vibration standard of 80 vibration decibels (VdB) (FTA 2006:7-1 – 7-8).

4.11.2 ENVIRONMENTAL SETTING

SOUND FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, unexpected, or unwanted. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave by a disturbance or vibration that causes pressure variation in air that the human ear can detect.

SOUND PROPERTIES

A sound wave is introduced into a medium (air) by a vibrating object. The vibrating object (e.g., vocal chords, the string of a guitar or the diaphragm of a radio speaker) is the source of the disturbance that moves through the medium. The particles of the medium through which the sound moves are vibrating in a back and forth motion at a given rate (frequency). The frequency of a wave refers to how often the particles vibrate when a wave passes through the medium, and is measured as the number of complete back-and-forth vibrations of a particle per unit of time. One complete back-and-forth vibration is called a cycle. The common unit used for frequency is in cycles per second, or Hertz (Hz). In addition, a sound wave is a pressure wave, oscillating in pressure from high to low and back to high pressure. Thus, the frequency of a sound wave refers not only to the number of back-and-forth vibrations of the particles per unit of time but also to the number of compression disturbances that pass a given point per unit of time.

A wave is an energy transport phenomenon that transports energy along a medium. The amount of energy carried by a wave is related to the amplitude (loudness) of the wave. A high-energy wave is characterized by large amplitude; a low-energy wave is characterized by small amplitude. The amplitude of a wave refers to the maximum amount of displacement of a particle from its rest position. The energy transported by a wave is directly proportional to the square of the amplitude of the wave. This means that a doubling of the amplitude of a wave is indicative of a quadrupling of the energy transported by the wave.

[1] PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal and is an expression of vibration amplitude. Refer to Section 4.11.2 for further clarification.

SOUND AND THE HUMAN EAR

Because of the ability of the human ear to detect a wide range of sound-pressure fluctuations, sound-pressure levels are expressed in logarithmic units called decibels (dB) to avoid a very large and awkward range in numbers. The sound-pressure level in decibels is calculated by taking the log of the ratio between the actual sound pressure and the reference sound pressure and then multiplied by 20. The reference sound pressure is considered the absolute hearing threshold (Caltrans 2009: 2-7 – 2-8). Use of this logarithmic scale reveals that the total sound from two individual 65-dB sources is 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB).

Because the human ear is not equally sensitive to all audible frequencies, a frequency-dependent rating scale was devised to relate noise to human sensitivity. An A-weighted decibel (dBA) scale performs this compensation by discriminating against frequencies that are more sensitive to humans. The basis for compensation is the faintest sound audible to the average ear at the frequency of maximum sensitivity. This dBA scale has been chosen by most public agencies for the purpose of regulating environmental noise. Typical indoor and outdoor noise levels are presented in Exhibit 4.11-2.

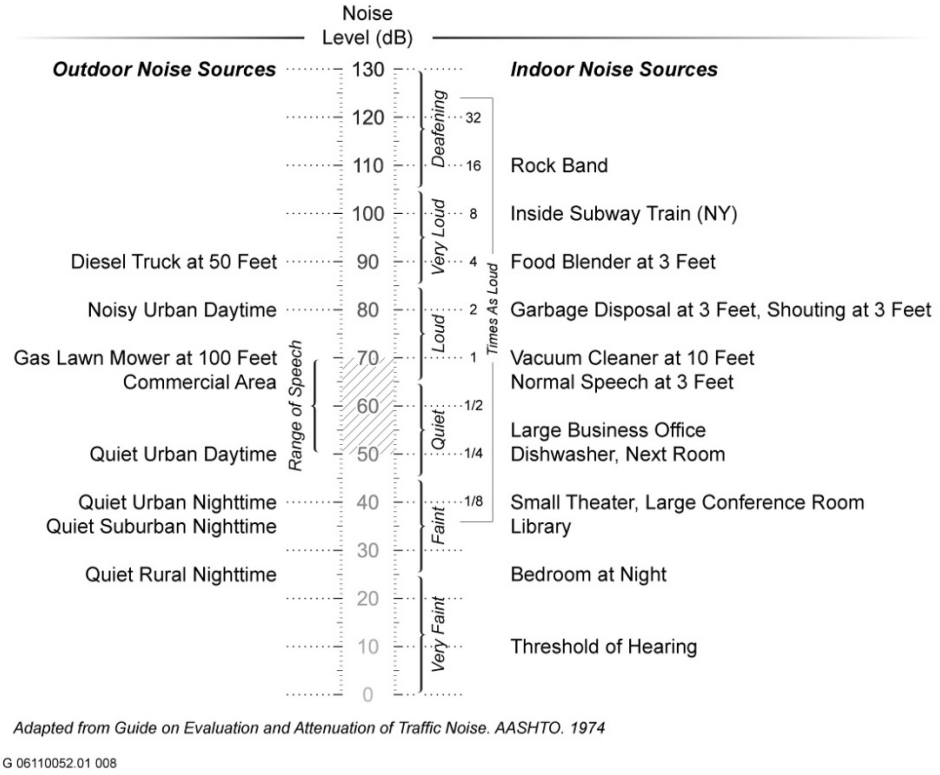


Exhibit 4.11-2 Typical Noise Levels

Table 4.11-3 provides human perception and reaction to changes in noise levels:, a 1-dBA increase is imperceptible, a 3-dBA increase is barely perceptible, a 6-dBA increase is clearly noticeable, and a 10-dBA increase is subjectively perceived as approximately twice as loud (Caltrans 2009: 2-7 – 2-8). Table 4.11-3 was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise and to changes in levels of a given noise source, and most likely applicable to noise levels in the range of 50 to 70 dBA, as this is the usual range of voice and interior noise levels. An exterior ambient noise level increase of 10 dBA or more (i.e., perceived as twice as loud) is typically considered a substantial increase in the existing ambient noise environment.

Table 4.11-3 Subjective Reaction to Changes in Noise Levels of Similar Sources		
Change in Level, dBA	**Subjective Reaction**	**Factor Change in Acoustical Energy**
1	Imperceptible (Except for Tones)	1.3
3	Just Barely Perceptible	2.0
6	Clearly Noticeable	4.0
10	About Twice (or Half) as Loud	10.0
Note: dBA = A-weighted decibels Source: Egan 1988:21		

SOUND PROPAGATION AND ATTENUATION

As sound (noise) propagates from the source to the receptor, the attenuation, or noise reduction with distance, is dependent on surface characteristics, atmospheric conditions, and the presence of physical barriers. Sound travels uniformly outward from a point source in a spherical pattern with an attenuation rate of 6 dBA (for acoustically hard sites) to 7.5 dBA (for acoustically soft sites) per doubling of distance. However, from a line source (e.g., a road), sound travels uniformly outward in a cylindrical pattern with an attenuation rate of 3 dBA (for acoustically hard sites) to 4.5 dBA (for acoustically soft sites) per doubling of distance. The surface characteristics between the source and the receptor result in the additional sound absorption (soft site) and/or reflection (hard site). Atmospheric conditions, such as wind speed, temperature, and humidity may affect noise levels. Furthermore, the presence of a barrier between the source and the receptor may also attenuate noise levels. The actual amount of attenuation is dependent upon the size and location of the barrier, and the frequency of the noise. Noise barrier may be natural or human-made features such as a hill, tree, building, wall, or berm (Caltrans 2009:2-40).

All buildings provide exterior-to-interior noise reduction. A building constructed with a wood frame and a stucco or wood exterior sheathing typically provides a minimum exterior-to-interior noise reduction of 25 dBA with its windows closed, whereas a building constructed of a steel or concrete frame, a curtain wall or masonry exterior wall, and fixed plate glass windows of one-quarter-inch thickness typically provides an exterior-to-interior noise reduction of 30–40 dBA with its windows closed (Paul S. Veneklasen & Associates 1973, cited in Caltrans 2002:7-37).

NEGATIVE EFFECTS OF NOISE ON HUMANS

Negative effects of noise exposure include physical damage to the human auditory system, interference, and disease. Exposure to noise may result in physical damage to the auditory system, which may lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over a period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a short period. Gradual and traumatic hearing loss both may result in permanent hearing damage. In addition, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal may be considered dangerous. Noise may also be a contributor to diseases associated with stress, such as hypertension, anxiety, and heart disease. The degree to which noise contributes to such diseases depends on the frequency, bandwidth, the level of the noise, and the exposure time (Caltrans 2009: 2-65 – 2-66).

VIBRATION

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 groundborne 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, groundborne vibrations may be described by amplitude and frequency.

Vibration amplitudes are usually expressed in peak particle velocity (PPV) or root mean squared (RMS) vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. Root-mean-square is defined as the positive and negative statistical measure of the magnitude of a varying quantity. PPV is often used in monitoring of blasting vibration because it is related to the stresses that are experienced by buildings (FTA 2006: 7-3 – 7-4).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. The human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2006: 7-3 – 7-4). This is based on a reference value of 1 microinch per second (μin/sec).

The background vibration-velocity level in residential areas is usually approximately 50 VdB. Groundborne 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 (FTA 2006: 7-5 – 7-8).

Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne 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. Construction activities can generate groundborne vibrations, which can pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FTA 2006: 7-10 – 7-11).

Construction vibrations can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations result from vibratory pile drivers, large pumps, horizontal directional drilling, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment. Table 4.11-4 describes the general human response to different levels of groundborne vibration-velocity levels.

Table 4.11-4
Human Response to Different Levels of Groundborne Noise and Vibration

Vibration-Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Note: VdB = vibration decibels referenced to 1 micro inch per second and based on the root mean square velocity amplitude.
Source: FTA 2006:7-8

EXISTING NOISE ENVIRONMENT

Existing Noise-Sensitive Land Uses

Noise-sensitive land uses generally include those uses where exposure to noise would result in adverse effects, as well as uses where quiet is an essential element of their intended purpose.

Noise-Sensitive Areas

Noise-sensitive land uses (sensitive receptors) generally are those uses where exposure to noise would result in adverse effects, as well as uses where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Other noise-sensitive land uses are schools, hospitals, convalescent facilities, parks, hotels, places of worship, libraries, and other uses where low interior noise levels are essential. Noise sensitive receptors are located throughout the County and are of special concern in this analysis considering the rural nature of the County.

Existing Noise Sources

Amador County is mainly rural in nature with automobile traffic representing the primary source of noise. The roadways in the County with the highest traffic volumes are State Route (SR) 88, SR 16 and SR 49, but other roadways also carry substantial volumes of traffic. Other noise sources include agricultural operations, residential noise (landscaping, home maintenance), commercial/industrial operations, community and school events, railroad passages, and aircraft over-flights including operations at Eagle's Nest and Westover Field.

Roadway Traffic Noise

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) with the Calveno vehicle noise emission curves was used to predict existing traffic noise levels within unincorporated areas of Amador County. The FHWA Model is the traffic noise prediction model currently preferred by FHWA, Caltrans, and most county and city governments, for use in traffic noise assessment. Although the FHWA Model was recently replaced by TNM, the use of RD-77-108 is still considered acceptable for the development of General Plan traffic noise predictions.

Table 4.11-5 shows existing (derived from 2013 conditions) average daily traffic (ADT) volumes for the major roadways located within the unincorporated areas of Amador County.[2] It also contains FHWA Model input data pertaining to vehicle distribution characteristics based on Caltrans traffic counts and from the Traffic background analysis, and the modeled distance from the roadway centerline to the 55, 60, and 65 CNEL/L_{dn} contours for each affected roadway segment in the project study area under existing conditions.

The roadway traffic noise levels shown in Table 4.11-5 represent conservative potential noise exposure, which assume no natural or artificial, shielding or reflection from existing or proposed structures or topography. Actual noise levels would vary from day to day, depending on factors such as local traffic volumes and speed, shielding from existing and proposed structures, variations in attenuation rates resulting from changes in surface parameters, and meteorological conditions. Exhibit 4.11-3 provides graphical representation of roadway traffic noise level contours, based on the distances to L_{dn} contour, provided in Table 4.11-5.

[2] A 2013 baseline was used for traffic noise because the Amador County Transportation Commission (ACTC) requested in an NOP comment that the County use ACTC's most current traffic model in its EIR analysis; the same baseline traffic levels were used to model traffic noise for consistency. Because of the economic recession conditions in Amador County between 2009 and 2013, these 2013 data are considered to be representative of conditions at the time of the NOP's release in 2009.

Table 4.11-5
Summary of Roadway Traffic Noise Modeling under Existing Conditions

Roadway Name	Segment Location		Average Daily Traffic (Trips)	dBA L_{dn} at 100 ft	Distance to L_{dn} Contour (feet)		
					65 dBA	60 dBA	55 dBA
16	East of Sacramento	Amador County Line	6,300	64.1	87	187	404
16	Amador County Line	West of Old Sacramento Rd	7,650	64.9	99	213	460
16	West of Old Sacramento Rd	West of Latrobe Rd	7116	64.6	94	203	438
16	West of Latrobe Rd	East of Jct. 124 South	9000	65.6	110	238	512
26	South of Jct. Rte. 88	Amador County Line	2,400	59.8	45	97	209
49	North of Calaveras County	Amador County Line	5,800	63.9	84	181	390
49	Amador County Line	South of Jct. Rte. 88 North (Martell)	17,400	68.6	175	376	811
49	South of Jct. Rte. 88 North (Martell)	North of Jct. Rte. 104 West (Martell)	17,800	68.3	166	358	772
49	North of Jct. Rte. 104 West (Martell)	North of Main St (Old Hwy 49) near Amador City	6,603	63.8	84	180	389
49	North of Main St (Old Hwy 49) near Amador City	South of Jct. Rte. 16 West Central House	10,700	66.6	128	276	594
49	South of Jct. Rte. 16 West Central House	South of Bush Street (Plymouth)	8,700	65.7	111	240	517
49	South of Bush Street (Plymouth)	North of Miller Way (Plymouth)	1,887	58.3	37	80	172
49	North of Miller Way (Plymouth)	El Dorado County Line	2,000	58.8	39	83	179
88	East of San Joaquin County	Amador County Line	8,700	65.8	114	245	527
88	Amador County Line	West of SR 124	7,700	65.3	105	226	486
88	West of SR 124	East of Buena Vista Rd	7,900	63.7	82	177	381
88	East of Buena Vista Rd	East of SR 104 West	11,200	65.2	104	223	480
88	East of SR 104 West	West of SR 104 East	13,300	66.0	116	250	539
88	West of SR 104 East	West of Jct. Rte. 49 (Martell)	13,000	55.9	25	53	114
88	West of Jct. Rte. 49 (Martell)	East of Court Street	8,293	64.9	98	211	454
88	East of Court Street	West of Ridge Rd (Pine Grove)	11,308	66.2	120	259	558
88	West of Ridge Rd (Pine Grove)	East of Ridge Road (Pine Grove)	17,200	68.3	166	357	769
88	East of Ridge Road (Pine Grove)	West of Tiger Creek Road	6,300	63.9	85	183	394
88	West of Tiger Creek Road	West of Inspiration Drive	3,850	61,8	61	132	283
88	West of Inspiration Drive	West of Mormon Emigrant Trail	2,600	60.4	49	106	227
88	West of Mormon Emigrant Trail	West of Kirkwood Meadows Drive	2,750	60.6	51	110	236
104	East of Sacramento	Amador County Line	2,300	57.1	44	96	236
104	Amador County Line	East of Michigan Bar Road	4,150	59.6	66	142	305

Table 4.11-5
Summary of Roadway Traffic Noise Modeling under Existing Conditions

Roadway Name	Segment Location		Average Daily Traffic (Trips)	dBA L_{dn} at 100 ft	Distance to L_{dn} Contour (feet)		
					65 dBA	60 dBA	55 dBA
104	East of Michigan Bar Road	West of Jct. Rte. 124 South (Ione)	9,400	63.2	110	237	511
104	West of Jct. Rte. 124 South (Ione)	North of SR 88	3,521	59.0	54	117	252
104	North of SR 88	West of Jct. Rte. 49 (Martell)	5,100	60.6	69	150	322
Ridge Rd	West of Jct. Rte. 49 (Martell)	East of Old Ridge Road	11,942	64.3	122	264	568
Ridge Rd	East of Old Ridge Road	West of New York Ranch Road	11,083	63.8	137	296	637
Ridge Rd	West of New York Ranch Road	West of Climax Road	7,518	62.1	106	228	492
Ridge Rd	West of Climax Road	East of Climax Road	6,006	61.2	91	197	424
Ridge Rd	East of Climax Road	West of SR 88	6,134	61.2	93	199	424
124	West of SR 88	North of Jct. Rte. 88 (near Ione)	5,000	60.4	79	169	365
124	North of Jct. Rte. 88 (near Ione)	South of Washington (on Church St, Ione)	6,000	61.2	89	191	412
124	South of Washington (on Church St, Ione)	South of Sutter Ione Rd	3,700	59.1	61	130	281
124	South of Sutter Ione Rd	North of Sutter Ione Rd	3,700	59.1	61	130	281
124	North of Sutter Ione Rd	South of Jct. Rte. 16, Waites Station	3,800	59.3	62	133	286
Buena Vista Rd	County Line	East of Coal Mine Road	795	51.3	12	26	59
Buena Vista Rd	East of Coal Mine Road	North of Jackson Valley Rd	1,564	54.2	19	41	89
Buena Vista Rd	North of Jackson Valley Rd	South of Highway 88	1,906	55.1	22	47	101
Buena Vista Rd	South of Highway 88	South of Highway 124	2,064	55.4	23	50	107
Bunker Hill Rd	South of New Chicago Road	South of New Chicago Road	59	40.0	2	5	10
Butte Mtn Rd	East of Clinton Rd	Clinton Rd	628	50.3	10	22	48
Camanche Parkway	San Joaquin County Line	Camanche Road	1,195	53.1	16	34	74
Camanche Rd	North of Camanche Parkway	Buena Vista	808	51.4	12	27	57
Camanche Rd	South of Jackson Valley Rd	South of Jackson Valley Rd	1,658	54.5	20	43	92
Carbondale Rd	North of Michigan Bar Road	Old Lambert Rd	169	44.6	4	9	20
Climax Road	East of Ridge Road	West of Highway 88	1,820	54.9	21	46	98
Climax Road	West of Highway 88	West of Highway 88	1,069	52.6	15	32	69
Clinton Road	North of Butte Mtn Rd	West of Butte Mtn Cutoff	473	49.0	9	19	40
Eureka Road	East of Sutter Hill Rd	West of Old Ridge Road	2,475	56.2	26	56	121
Fiddletown Rd	East of Shenandoah Road	East of Hale Road	1,610	54.3	19	42	91
Fiddletown Road	East of Hale Road	Shake Ridge Rd	592	50.0	10	22	46
Jackson Gate Road	East of Highway 49	China Graveyard Rd	2,209	55.7	24	52	112

Table 4.11-5
Summary of Roadway Traffic Noise Modeling under Existing Conditions

Roadway Name	Segment Location		Average Daily Traffic (Trips)	dBA L_{dn} at 100 ft	Distance to L_{dn} Contour (feet)		
					65 dBA	60 dBA	55 dBA
Jackson Valley Rd (west)	South of SR 88	Camanche Road	640	50.3	11	23	49
Jackson Valley Road	Camanche Road	East of Buena Vista	1,294	53.4	17	36	78
Jackson Valley Rd (east)	East of Buena Vista	South of SR 88	1,492	54.0	19	40	86
Latrobe Road	North of Highway 16	South of Old Sacramento	1,860	55.0	21	46	100
Latrobe Road	South of Old Sacramento	At County Line	2,510	56.3	26	56	122
Michigan Bar Road	North of Highway 16	At County Line	2,001	55.3	23	49	105
Mt. Zion Road	South of Highway 88	South of Highway 88	417	48.5	8	17	37
New York Ranch Road	South of Ridge Road	North of Court St	6,791	60.6	51	110	236
Old Ridge Road	East of Eureka Road	North of Ridge Rd	2,511	56.3	26	56	122
Old Sacramento Road	West of Plymouth City Limits	East of Latrobe Road	878	51.7	13	28	60
Old Stockton Rd	North of SR 88	South of Cook Rd	266	46.5	6	13	27
Rams Horn Grade	Volcano Road	East of Volcano Road	748	53.2	16	35	76
Shakeridge Road	Pine Gulch and Oneto Road	Highway 88	1,594	56.4	27	59	126
Shenandoah Road	North of Fiddletown Road	Near Dickson Road	3,057	59.3	42	90	195
Shenandoah Road	Near Dickson Road	County line	2,525	58.5	37	80	171
Shenandoah Road	At Post Mile Marker 8.00		2,022	57.5	32	69	148
Steiner Road	North of Shenandoah Road	North of Shenandoah Road	403	50.5	11	23	50
Stony Creek Road	West of Argonaut Lane	East of Buena Vista Rd	293	49.2	9	19	41
Stony Creek Rd	East of Buena Vista Rd	East of Buena Vista Rd	911	54.1	19	40	87
Sutter Creek Road	East of Pine Gulch	Main Street	480	51.3	12	26	57

Notes: dB = A-weighted decibels; L_{dn} = Day-Night Noise Level

* Traffic noise levels are predicted at a standard distance of 100 feet from the roadway centerline and do not account for shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.

Source: Data modeled by AECOM in 2014 (based on 2014 ACTC Traffic Model Data)

Railroad Noise

Amador County's sole rail operator is Union Pacific. Union Pacific runs 4 daily trips (FRA 2012) through central Amador County passing through the county's western border to the Ione area. (see Exhibit 4.11-3).

To determine the distances to the L_{dn} railroad contours, it was necessary to calculate the L_{dn} for average daily train operations using the Federal Railroad Administration (FRA) Train Horn Model (FRA 2010) for railroad noise. Using the mean SEL (single event level) recommended by the Federal Transit Administration (FTA) for railroad operations (both with and without warning horns), and the number of daily operations (4) the noise level at 100 feet and the approximate distances to the 65 dBA L_{dn} contours for the Amador County railroad were modeled (see Table 4.11-6). The purpose of calculating these levels is to determine typical sound exposure levels for railroad operations in Amador County and use them as a guide when making land use decisions in the immediate area.

Table 4.11-6
Summary of Railway Traffic Noise Modeling under Existing Conditions

Daily Operations	dBA L_{dn} at 100 feet		Distance to 65 dBA L_{dn} Contour (feet)	
	With horn	Without horn	With horn	Without horn
4	72	67	325 ft	137 ft
Modeling conducted by AECOM 2012				

Aircraft Noise

Westover Field

Westover Field is located in central Amador County one mile north of Jackson and bordering the city limits of Sutter Creek. Westover Field is home to approximately 107 aircraft, of which, approximately 100 are single-engine aircraft, approximately four are multi-engine aircraft, and approximately three are helicopters. Westover Field has approximately 34 aircraft operations per day. The airport noise contours from the Airport Land Use Plan for use in guiding future growth in the airport vicinity are presented in Exhibit 4.11-1 above.

Eagles Nest Airstrip

Eagle's Nest is located in northwestern Amador County approximately seven miles northwest of Ione. Eagle's Nest is a private airstrip currently averaging three flights per day, although up to 13 flights per day are permitted on the airstrip, and the airstrip can house up to 25 aircraft. Noise contours are required for public airports, but not private airstrips; therefore, contours have not been developed for Eagle's Nest.

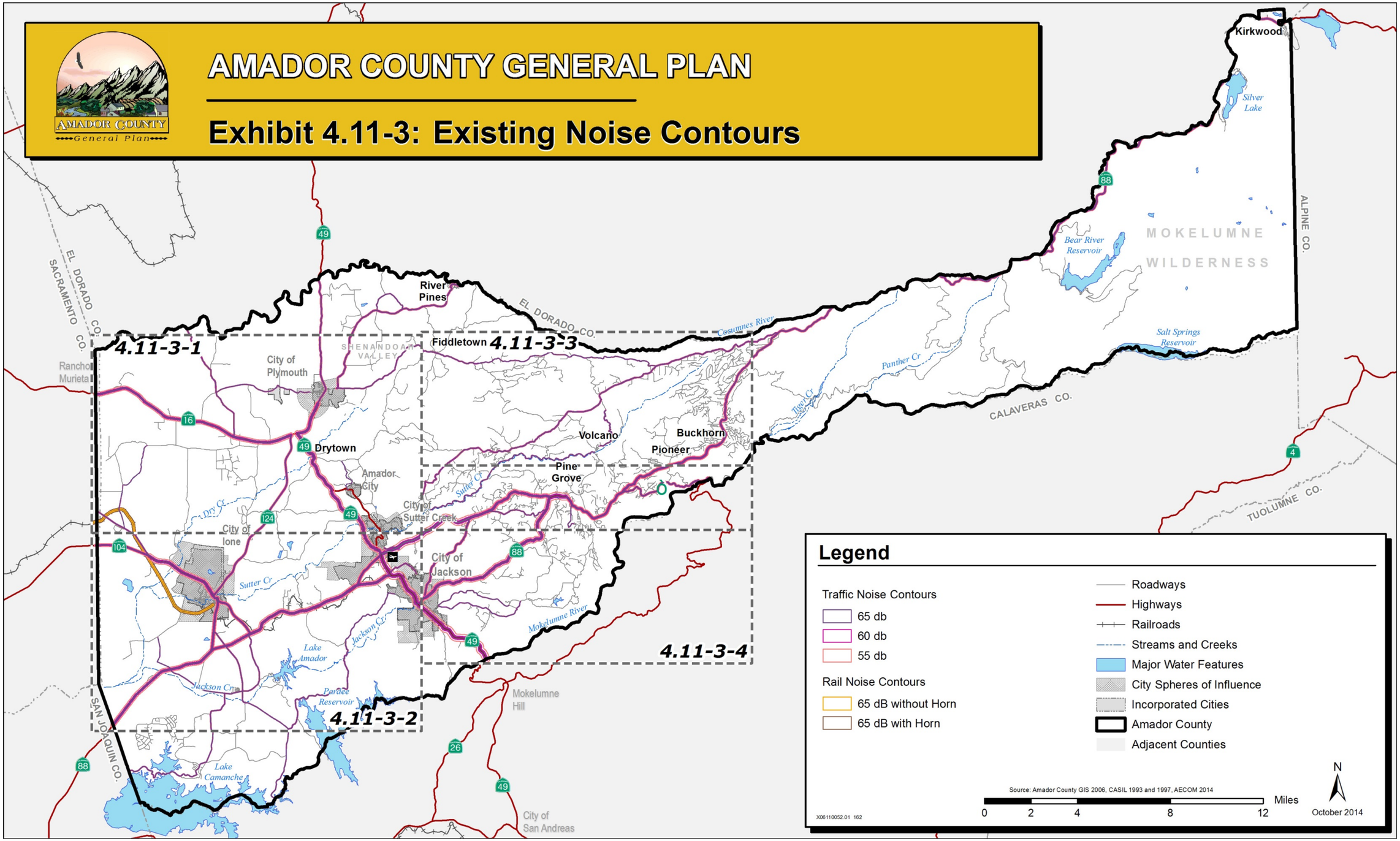
Stationary Sources of Noise

Many processes and activities produce noise, even when they employ the best available noise control technology. Noise exposures inside industrial facilities are controlled by Federal and State employee health and safety regulations; however, exterior noise levels may still exceed local standards. Commercial, recreational and public service facility activities can also generate noise affecting adjacent sensitive land uses. Existing stationary noise sources in Amador County are described below, and their locations are shown in Exhibit 4.11-4.

Daytime ambient noise monitoring was performed at the following facilities by AECOM in 2007, as summarized in Table 4.11-7, based on short-term (ST) noise measurements of approximately 15 minute durations, representing a one-hour average (L_{eq}).

AMADOR COUNTY GENERAL PLAN

Exhibit 4.11-3: Existing Noise Contours



Legend

Traffic Noise Contours
- 65 db
- 60 db
- 55 db

Rail Noise Contours
- 65 dB without Horn
- 65 dB with Horn

- Roadways
- Highways
- Railroads
- Streams and Creeks
- Major Water Features
- City Spheres of Influence
- Incorporated Cities
- Amador County
- Adjacent Counties

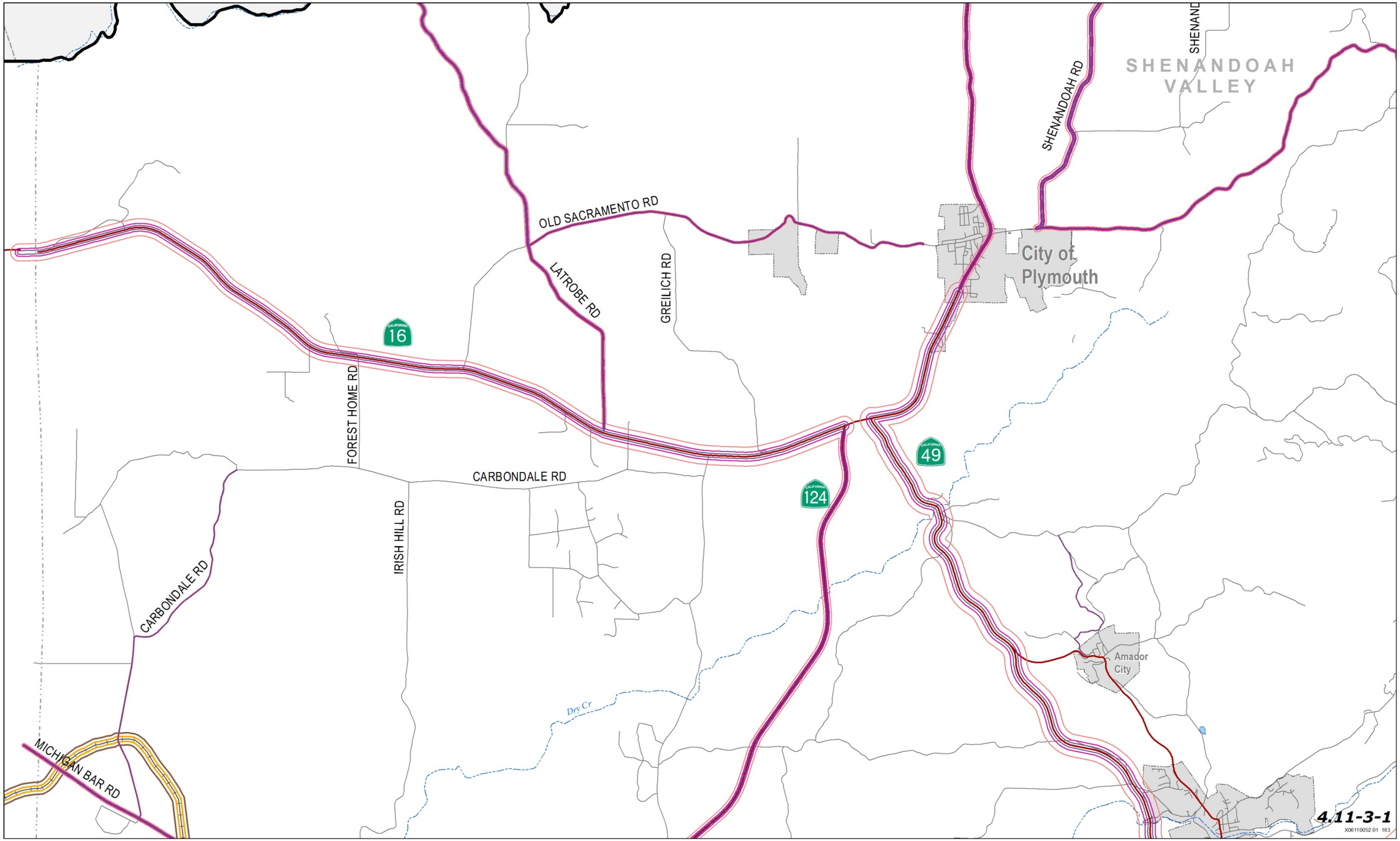
Source: Amador County GIS 2006, CASIL 1993 and 1997, AECOM 2014

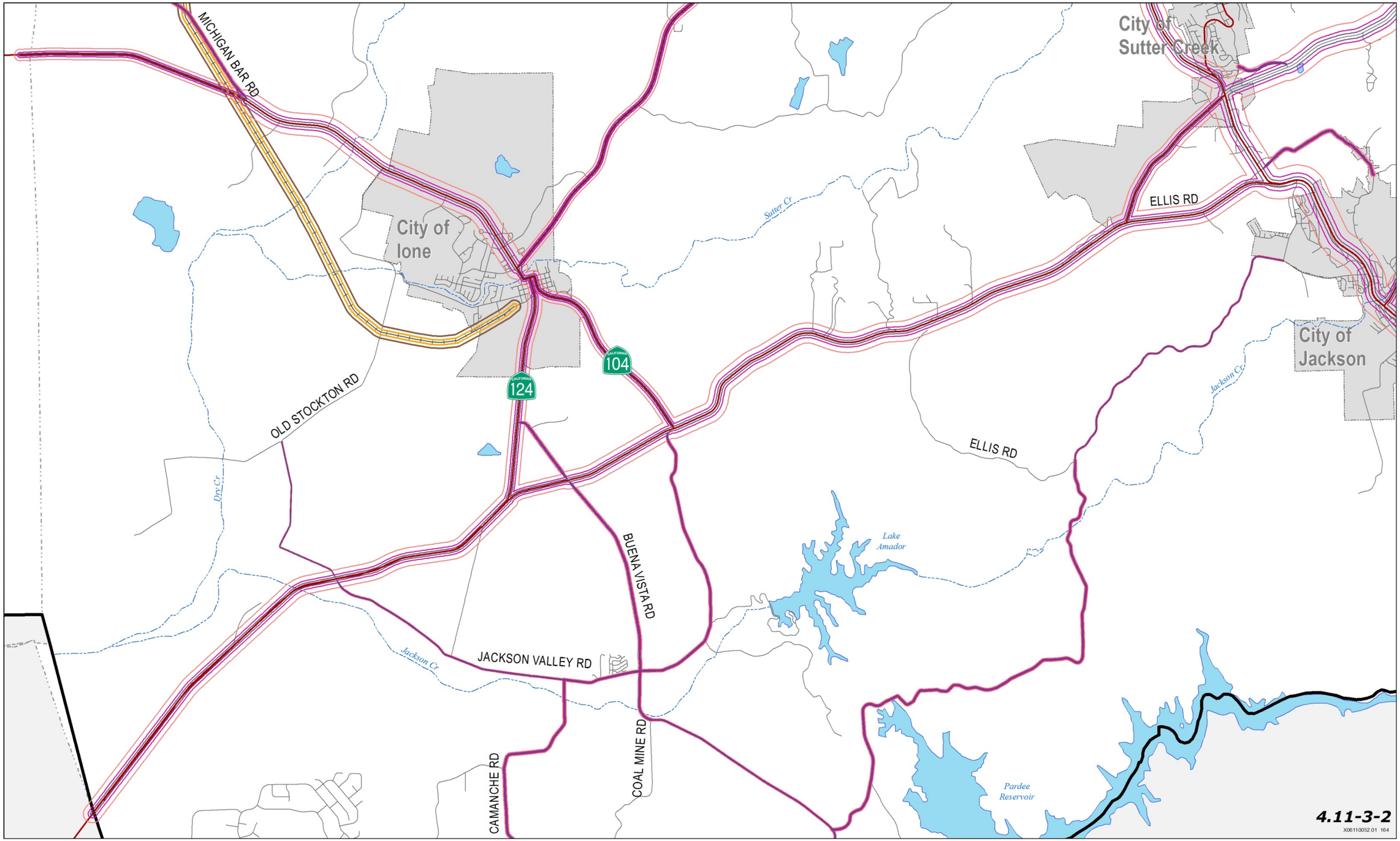
0 2 4 8 12 Miles

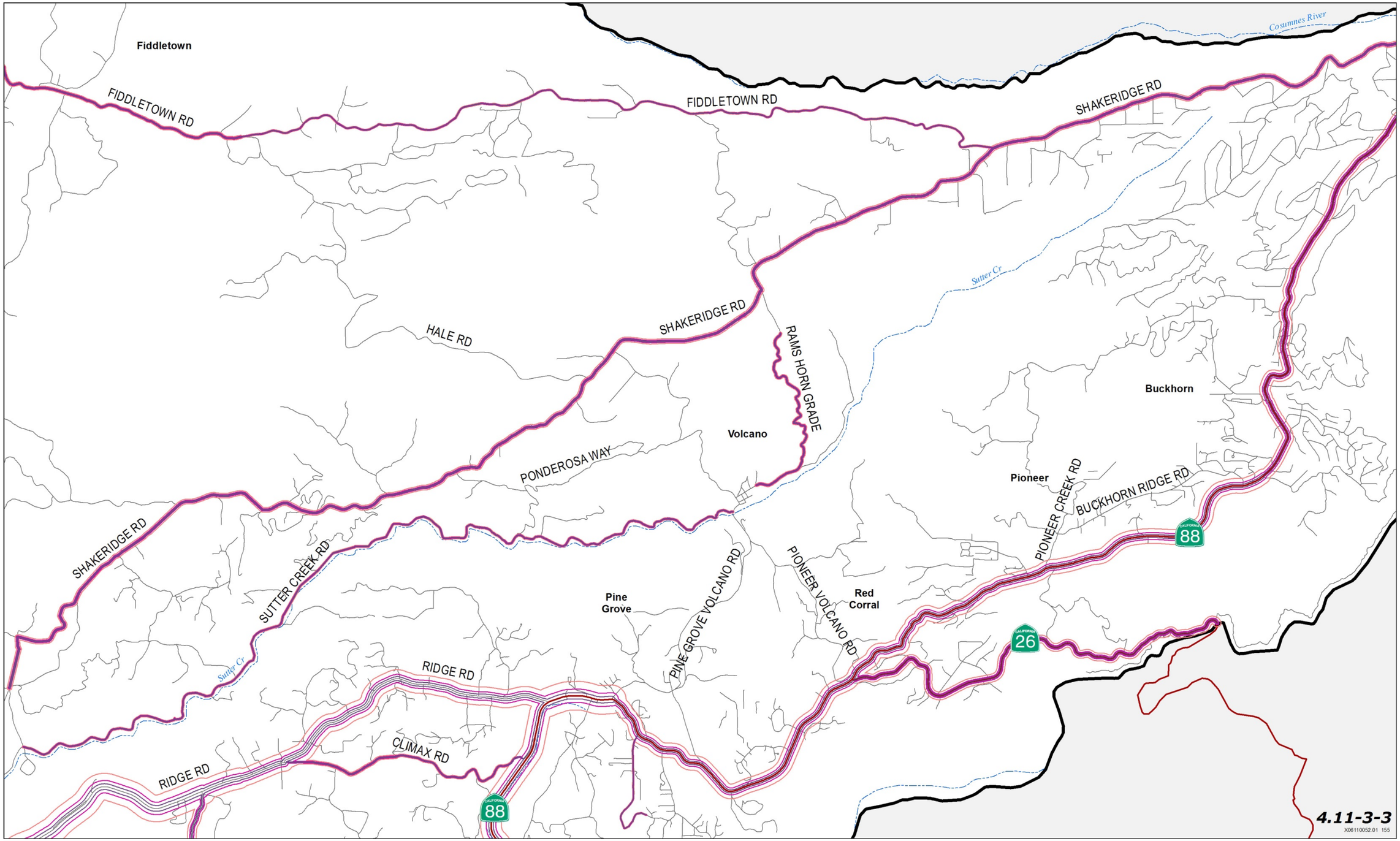
N

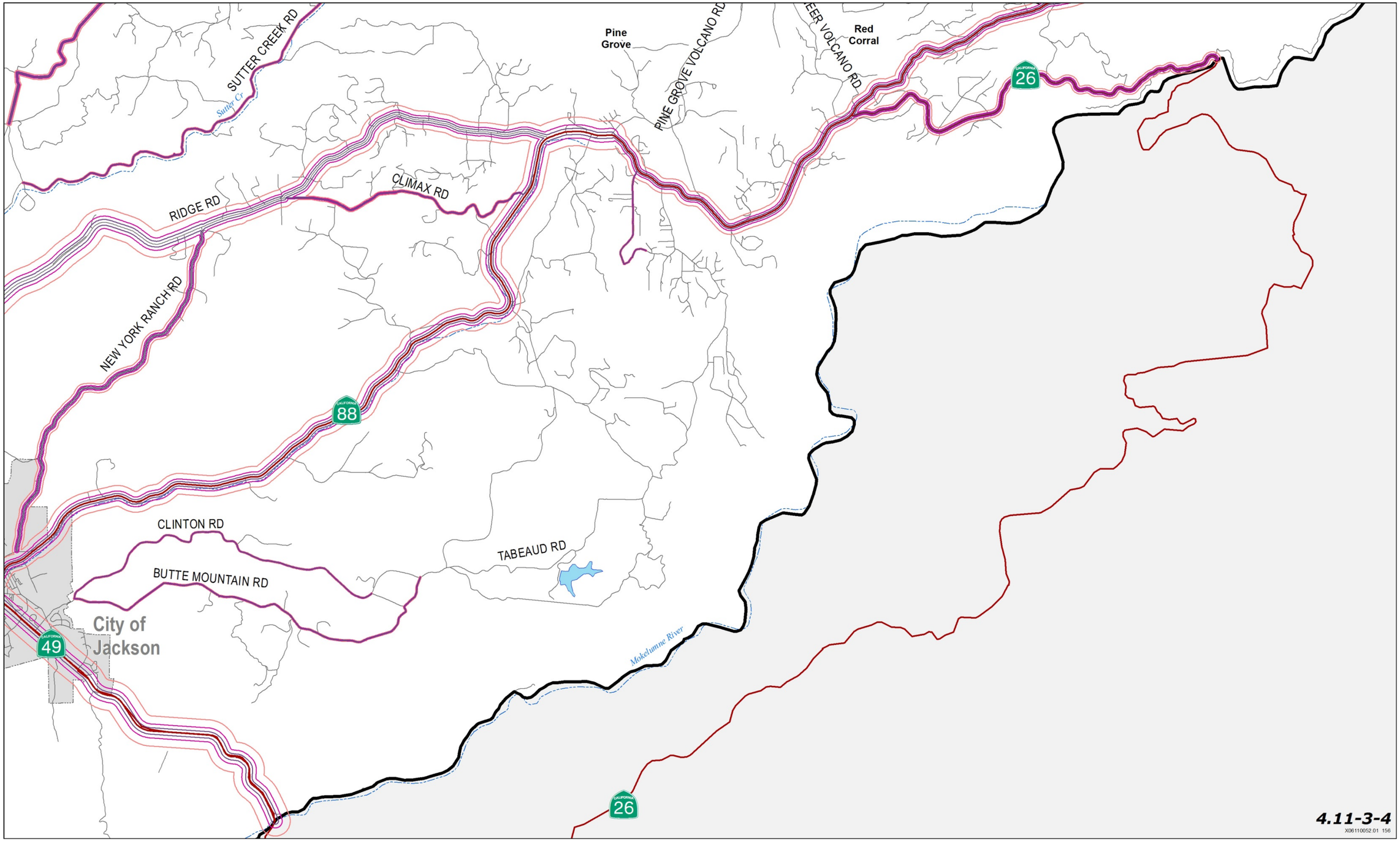
October 2014

X06110052.01 162


SHENANDOAH VALLEY
SHENANDOAH RD
OLD SACRAMENTO RD
LATROBE RD
GREILICH RD
City of Plymouth
16
FOREST HOME RD
CARBONDALE RD
IRISH HILL RD
49
124
CARBONDALE RD
Amador City
Dry Cr
MICHIGAN BAR RD
4.11-3-1
X06110052.01 163


MICHIGAN BAR RD
City of Ione
City of Sutter Creek
City of Jackson
ELLIS RD
ELLIS RD
Sutter Cr
104
124
OLD STOCKTON RD
Dry Cr
BUENA VISTA RD
Lake Amador
JACKSON VALLEY RD
Jackson Cr
Jackson Cr
CAMANCHE RD
COAL MINE RD
Pardee Reservoir
4.11-3-2
X06110052.01 164


Fiddletown
FIDDLETOWN RD
FIDDLETOWN RD
SHAKERIDGE RD
Cosumnes River
HALE RD
SHAKERIDGE RD
RAMS HORN GRADE
Sutter Cr
Buckhorn
Volcano
PONDERosa WAY
Pioneer
PIONEER CREEK RD
BUCKHORN RIDGE RD
SHAKERIDGE RD
SUTTER CREEK RD
Pine Grove
PINE GROVE VOLCANO RD
PIONEER VOLCANO RD
Red Corral
Sutter Cr
RIDGE RD
CLIMAX RD
RIDGE RD
88
26
88
4.11-3-3
X06110052.01 155


SUTTER CREEK RD
Sutter Cr
Pine Grove
PINE GROVE VOLCANO RD
VOLCANO RD
Red Corral
26
RIDGE RD
CLIMAX RD
NEW YORK RANCH RD
88
CLINTON RD
BUTTE MOUNTAIN RD
TABEAUD RD
City of Jackson
49
Mokelumne River
26
4.11-3-4
X06110052.01 156

AMADOR COUNTY GENERAL PLAN

Exhibit 4.11-4: Noise Measurement Locations

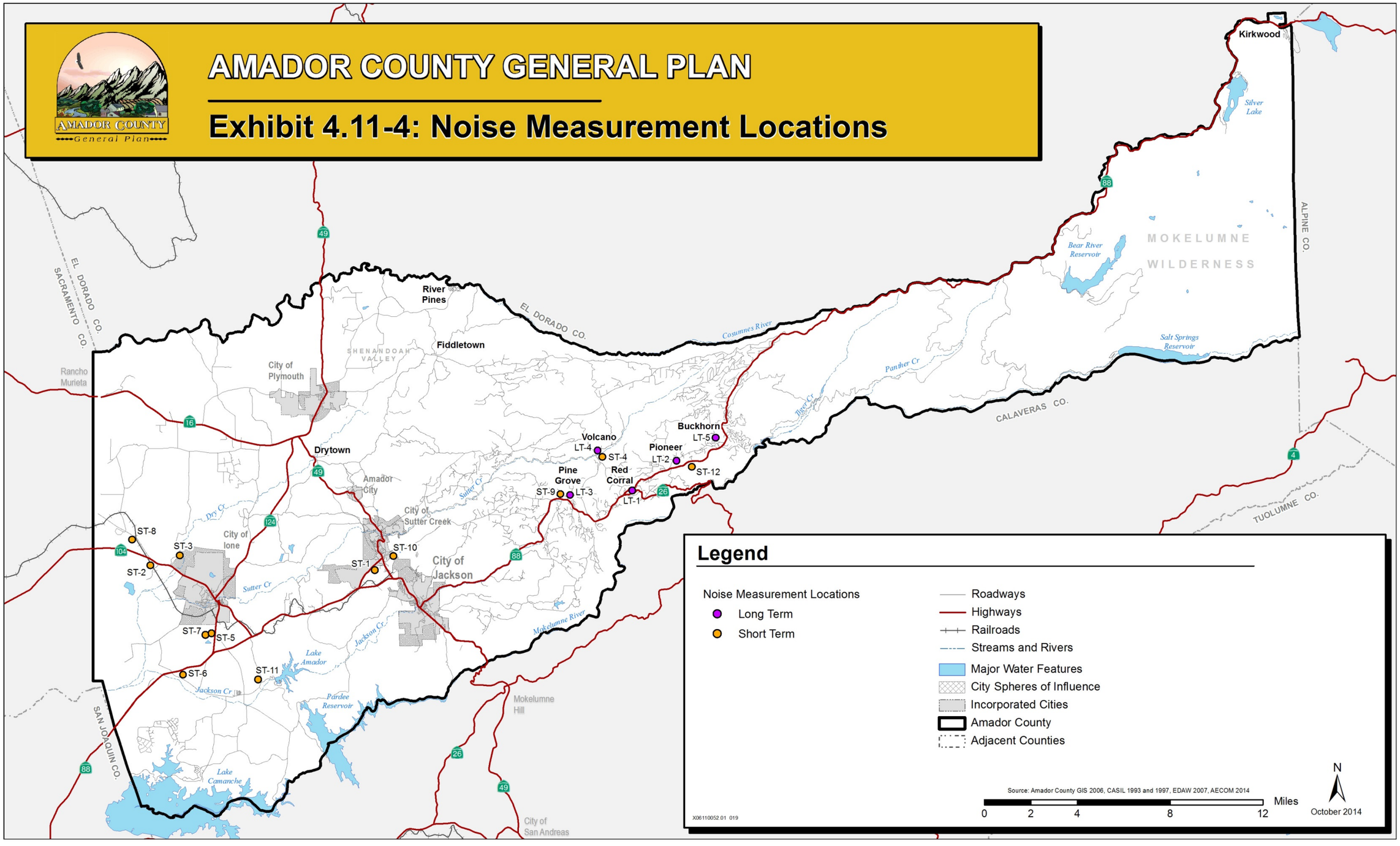


Table 4.11-7
Summary of Stationary Source Short-Term (ST) Noise Monitoring

Facility	Time	Date	Measurement ID	Location	Type	L_{eq} (dBA) @ 100 ft	55 dBA L_{eq} contour (ft)
SierraPine	1:30 pm	5/16/07	ST-1	Martell	Wood Mfg	82.6	2,200
Hanson ISP	9:00 am	5/16/07	ST-2	Ione	Quarry	82.8	2,200
DeSilva	12:40 pm	5/16/07	ST-3	Ione	Quarry	64.6	300
Kreth – Volcano	3:00 pm	5/15/07	ST-4	Volcano	Quarry	66.0	350
Unimin	10:15 am	5/16/07	ST-5	Ione	Quarry	61.4	200
George Reed	10:50 am	5/16/07	ST-6	Ione	Quarry	74.2	900
Ione Mineral		5/16/07	ST-7	Ione	Quarry	49.4	60
US Tile	12:30 pm	5/15/07	ST-8	Ione	Tile Mfg	55.3	100
Pine Grove Transfer Station	2:30 pm	5/15/07	ST-9	Pine Grove	Waste	60.6	200
MP Associates	8:10 am	5/24/07	ST-11	Ione	Explosives	50.0	60

Source: Monitoring conducted by AECOM 2007

SierraPine – Ampine

SierraPine operates a wood products manufacturing plant located between Jackson and Sutter Creek off of SR 104/Lower Ridge Road. Noise sources include boilers, heavy trucks, and other large manufacturing equipment. Operations are 24-hours per day.

Quarries and Mining Operations

Amador County has a large number of active quarries and mining operations, the majority of which are near Ione. Noise measurements ST-2 through ST-7 were taken near several of these operations and are summarized in Table 4.11-7. These types of operations require large conveyors, rock crushers, heavy trucks for transport, and other large facilities and machines that generate high noise levels. Additionally many quarries run during more sensitive night and evening hours to save on electricity costs.

US Tile

US Tile is located northwest of Ione on Michigan Bar Road. It is adjacent to a propane facility and the Lilliput "radio-controlled model airplane" airstrip. Noise sources include tile manufacturing equipment, forklifts, and heavy trucks. Based on sound measurements taken in 2007, the 55 dBA contour would be located within the property lines of US Tile and the adjacent propane facility. (see Table 4.11-7)

Pine Grove Waste Transfer Station

The Transfer Station is located off Berry Street in central Pine Grove. Operations fluctuate based on waste levels, but on average 15 one-way truck trips occur per day. This includes four different types of waste vehicles and the tractor trailer loads that take waste to landfills. Trucks begin leaving at 3:00 a.m. and return by 2:00 p.m. Additionally, an on-site loader moves waste into piles and loads it onto tractor trailers from 7a.m. to approximately 2 p.m.

MP Associates Explosives

MP Associates is located south of Hwy 88 on Jackson Valley Road, directly across from Lake Amador Road. MP Associates manufacturers explosives and test them on site. Noise measurement ST-11 was taken from the facility's property line along Jackson Valley Road and measured explosions occurring at 45–50 dBA at 1,000–2,000 feet. The one hour average noise level was measured at 64.9 dBA L_{eq} as a result of passing traffic on Jackson Valley Road.

Community Noise Survey

To quantify existing noise levels in the quieter parts of Amador County, a community noise survey, which consisted of long-term (LT) measurements was performed at five locations within the County that are removed from major noise sources. The five locations were each monitored for one continuous 24 hour period. The results of the community noise survey are provided in Table 4.11-8.

Table 4.11-8
Summary of Community Noise Survey Long-Term Measurements

Date/Time	Measurement ID	Location	Community	CNEL/L_{dn}	L_{eq} Day	L_{eq} Night
4:00 pm 5/15/07	LT-1	Rocky Lane	Red Corral	55.3	49.0	48.2
4:00 pm 5/14/07	LT-2	Buckhorn Ridge Road	Pioneer	52.5	47.7	42.8
3:00 pm 5/14/07	LT-3	Crestview Lane	Pine Grove	48.0	41.1	41.1
10:30 am 5/23/07	LT-4	Plug Street	Volcano	63.1	62.3	47.5
9:35 am 5/23/07	LT-5	Meadow Vista Drive	Buckhorn	44.4	41.5	32.6

Source: Monitoring conducted by AECOM 2007.

The community noise survey results show that the unincorporated rural communities have generally moderate to low CNEL's. Volcano's CNEL of 63.1 dBA is high, given Volcano's higher population density, compact street system, and geographic location. During Volcano's survey it was noted that small home improvement projects, lawn care activities, and the operation of HVAC units were all occurring which would cause an increase in the ambient measurement. The actual CNEL in Volcano is more likely closer to 55–56 dBA on a typical day, however due to activities surrounding the noise survey the level measured was higher.

The three sites in Buckhorn, Pioneer, and Pine Grove all had consistent measurements of daytime L_{eq}s of mid 40s to mid-50s dBA and nighttime L_{eq}s of low 30s–low 40s dBA. Red Corral's noise levels were more constant with daytime L_{eq}s in the low 50s dBA and nighttime L_{eq}s in the high 40s dBA.

4.11.3 IMPACTS AND MITIGATION MEASURES

ANALYSIS METHODS

For the Draft General Plan, the significance of anticipated noise effects was determined by comparing predicted noise levels to noise impact criteria defined by from various state and federal sources, including FTA, FAA, the Federal Interagency Committee on Aviation Noise (FICAN), Caltrans, and OPR. Noise impacts are considered significant if implementation of the Draft General Plan would result in noise impacts exceeding the below

thresholds. Where applicable noise policies and regulations would not reduce impacts to a less-than-significant level, mitigation measures are presented, including programs from the County's Implementation Plan.

THRESHOLDS OF SIGNIFICANCE

Based on the noise impact criteria in Appendix G to the CEQA Guidelines, with refinements specific to Amador County, a noise impact is considered significant if implementation of the Draft General Plan would do any of the following:

- result in a substantial temporary/periodic increase in ambient noise levels in the project vicinity above levels existing without the project,
- result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project,
- expose persons to or generation of noise levels in excess of applicable standards established by the County (in the Draft General Plan)3, or applicable standards of other agencies;
- expose people residing or working within an airport land use plan or within 2 miles of a public airport or public use airport, or the vicinity of a private airstrip, to excessive noise levels;
- expose persons to or generate excessive groundborne vibration or groundborne noise levels.

IMPACT ANALYSIS

IMPACT 4.11-1 ***Result in a Substantial Temporary or Periodic Increase in Ambient Noise Levels.*** *Short-term construction source noise levels could result in a substantial temporary or periodic increase in ambient noise levels at nearby noise-sensitive receptors. This impact would be* ***significant.***

Implementation of the Draft General Plan would result in the construction of new residential, commercial, and industrial land uses as illustrated in Table 3-1 (Chapter 3, "Project Description"), generating temporary or periodic construction noise. This construction noise would have the potential to impact noise sensitive land uses. Table 4.11-9 illustrates typical maximum noise levels associated with the operation of construction equipment at a distance of 50 feet.

As shown in Table 4.11- 9, construction equipment generates high levels of intermittent noise ranging from 55 dBA to 95 dBA at 50 feet. However, with equipment moving from one point to another, work breaks, and idle time, the average noise level is typically approximately 80 - 85 dBA L_{eq} at 50 feet from the center of construction activities. As shown on Table 4.11-8, daytime ambient noise levels in quieter parts of the County typically range between about 41 and 63 dBA L_{eq}. A substantial temporary increase in ambient noise levels would be an hourly average increase of 10 dBA L_{eq} during construction activity; as shown in Table 4.11-3, this increase is perceived by humans as twice as loud. Therefore, new project-generated noise levels from construction sources could result in a substantial temporary increase in the ambient noise environment at nearby noise sensitive receptors.

The Noise Element of the Draft General Plan contains policy N-1.3 that requires the County to evaluate potential noise conflicts for individual sites and projects, and require mitigation of all significant noise impacts (including construction and short-term noise impacts) as a condition of project approval. Although the County will require mitigation of construction noise impacts, some individual projects may not be able to reduce construction noise effects to a less-than-significant level. As such, impacts would be **significant**.

[3] Because the noise standards of the 1988 County General Plan Noise Element would no longer be in effect following adoption of the Draft General Plan, those standards are not used for the impact analysis.

Table 4.11-9 Construction Equipment Noise Levels	
Equipment Item	**Typical Maximum Noise Level (dBA) at 50 Feet**
Earthmoving	
Backhoes	80
Bulldozers	85
Front Loaders	80
Graders	85
Paver	85
Roller	85
Scrapers	85
Tractors	84
Slurry Trencher	82
Dump Truck	84
Pickup Truck	55
Materials Handling	
Concrete Mixer Truck	85
Concrete Pump Truck	82
Crane	85
Man Lift	85
Stationary Equipment	
Compressors	80
Generator	82
Pumps	77
Impact Equipment	
Compactor	80
Jack Hammers	85
Impact Pile Drivers (Peak Level)	95
Pneumatic Tools	85
Rock Drills	85
Other Equipment	
Concrete Saws	90
Vibrating Hopper	85
Welding Machine / Torch	73
Notes: dB = A-weighted decibels Noise levels are for equipment fitted with properly maintained and operational noise control devices, per manufacturer specifications. Source: Bolt, Beranek and Newman Inc. 1981: 8-5, FTA 2006:12-6	

Mitigation Measure 4.11-1a: Implement ~~Draft General Plan~~ Program D-11(m), Noise Standards

All construction equipment shall be properly maintained per manufacturers' specifications and fitted with the best available noise suppression devices (e.g., mufflers, silencers, wraps); all impact tools will be shrouded or shielded; and all intake and exhaust ports on power equipment will be muffled or shielded.

Responsible Agencies/Departments: Planning Department

Time Frame: Ongoing

Mitigation Measure 4.11-1b: Construction Noise Abatement

The County will require the use of noise control techniques during construction activities to avoid effects on nearby sensitive receptors. In addition to properly maintained construction equipment, these techniques may include temporary construction sound barriers adjacent to construction noise sources or receptors when all other feasible methods fail to reduce construction noise to acceptable levels.

Responsible Agencies/Departments: Planning Department

Time Frame: Ongoing

Significance after Mitigation

Implementation of Mitigation Measures 4.11-1a and 4.11-1b would reduce impacts from construction noise requiring on-site mitigation of noise-generating equipment and use of construction noise control techniques, potentially including temporary construction sound barriers, where appropriate. Individual, new development projects would be required to undergo project-specific environmental review. If project-level significant impacts are identified, project-specific mitigation measures would be required under CEQA. However, construction noise, depending on the location of nearby sensitive receptors in relation to a particular construction site, could result in a substantial temporary increase in ambient noise levels at those receptors even after all feasible mitigation measures are imposed. No additional feasible mitigation is available to reduce this impact to a less-than-significant level. As a result, impacts are **significant and unavoidable**.

IMPACT 4.11-2 ***Result in a Substantial Permanent Increase in Ambient (Traffic) Noise Levels****. Long-term project-generated traffic noise under the Draft General Plan could create a substantial permanent increase in ambient noise levels at noise-sensitive receptors due to increased traffic noise. This impact would be ~~is~~* ***significant****.*

Implementation of the Draft General Plan would include new development in the planning area, including buildings, structures, paved areas, roadways, utilities, and other improvements. Table 3-1 (Chapter 3, "Project Description") presents the anticipated land use changes, including new uses in the Martell Regional Service Center and the designated Town Centers in Pine Grove, Buckhorn, and River Pines. Development of new land uses consistent with the Draft General Plan would generate additional traffic. This increase in traffic would increase ambient noise levels at existing land uses along roadways. Chapter 4.14, "Transportation," describes future traffic conditions that would occur with implementation of the Draft General Plan.

A traffic noise impact is considered significant if implementation of the Draft General Plan results in "substantial" permanent increases in existing ambient noise levels. Table 4.11-10 (General Plan Implementation Table D-11-1) lists the thresholds that were used to determine whether a substantial permanent increase in noise levels would occur. These FICAN thresholds correlate with human response to changes in ambient noise levels and assess degradation of the ambient community noise environment.

To examine traffic noise impacts, traffic noise levels associated with the Draft General Plan were calculated for roadway segments in the planning area using FHWA's Highway Noise Prediction Model (FHWA-RD-77-108) (FHWA 1978). Traffic noise levels were modeled under future 2030 conditions. ADT volumes and distributions of those volumes, vehicle speeds, and truck volumes on local area roadways were calculated from field observations, photography surveys, and data collected for the Circulation Working Paper and the traffic analysis completed for this EIR.

Table 4.11-10 (General Plan Implementation Plan Table D-11-1) Significant Change in Ambient Noise Levels	
Existing Ambient Noise Level, L_{dn}/CNEL	**Significant Increase**
< 60 dBA	+ 5 dBA or greater
60 - 65 dBA	+ 3 dBA or greater
> 65 dBA	+ 1.5 dBA or greater

Note: CNEL = community noise equivalent level; dBA = A-weighted decibels; L_{dn} = day-night average noise level
Sources: Adapted from FICAN 1992:3-15 – 3-17

Table 4.11-11 summarizes modeled L_{dn} noise levels at 100 feet from the roadway centerline for affected roadway segments in the planning area under future 2030 conditions with the Draft General Plan implementation compared to existing conditions. The traffic noise levels presented represent an application of conservative traffic noise modeling methodologies which assume no natural or artificial shielding from existing or proposed structures or topography. Actual traffic noise exposure levels at noise sensitive receptors in the project vicinity would vary depending on a combination of factors such as variations in daily traffic volumes, shielding provided by existing and proposed structures, and meteorological conditions. Refer to Appendix F for complete modeling inputs and results. Exhibit 4.11-5 depicts future 2030 traffic noise levels along major roadways within the County.

Table 4.11-11
Predicted Traffic Noise Levels
Existing Conditions and Future 2030 General Plan Update Buildout Conditions

Roadway	Segment		L_{dn} at 100 Feet, dBA			
	From	To	Existing Conditions *	Future 2030 With Project*	Project Net Change	Significant Increase? (Impact 4.11-2)
16	East of Sacramento	Amador County Line	64.1	67.1	+3.0	Yes
16	Amador County Line	West of Old Sacramento Rd	64.9	67.5	+2.6	No
16	West of Old Sacramento Rd	West of Latrobe Rd	64.6	67.4	+3.2	Yes
16	West of Latrobe Rd	East of Jct. 124 South	65.6	69.3	+3.7	Yes
26	South of Jct. Rte. 88	Amador County Line	59.8	63.7	+3.9	No
49	North of Calaveras County	Amador County Line	63.9	68.4	+4.5	Yes
49	Amador County Line	South of Jct. Rte. 88 North	68.6	71.0	+2.7	Yes
49	South of Jct. Rte. 88 North	North of Jct. Rte. 104 West	68.3	71.0	+2.7	Yes
49	North of Jct. Rte. 104 West	North of Main St (Old Hwy 49) near Amador City	63.8	68.8	+5.0	Yes
49	North of Main St (Old Hwy 49) near Amador City	South of Jct. Rte. 16 West Central House	66.6	69.6	+3	Yes
49	South of Jct. Rte. 16 West Central House	South of Bush Street	65.7	68.6	+2.9	Yes
49	South of Bush Street	North of Miller Way	58.3	62.6	+4.3	No
49	North of Miller Way	El Dorado County Line	58.8	62.9	+4.1	No
88	East of San Joaquin	Amador County Line	65.8	69.0	+3.2	Yes

Table 4.11-11
Predicted Traffic Noise Levels
Existing Conditions and Future 2030 General Plan Update Buildout Conditions

Roadway	Segment		L_{dn} at 100 Feet, dBA			
	From	To	Existing Conditions *	Future 2030 With Project*	Project Net Change	Significant Increase? (Impact 4.11-2)
	County					
88	Amador County Line	West of SR 124	65.3	69.0	+3.7	Yes
88	West of SR 124	East of Buena Vista Rd	63.7	68.0	+4.3	Yes
88	East of Buena Vista Rd	East of SR 104 West	65.2	68.8	+3.6	Yes
88	East of SR 104 West	West of SR 104	66.0	69.5	+3.5	Yes
88	West of SR 104	West of Jct. Rte. 49	65.9	70.1	+4.2	Yes
88	West of Jct. Rte. 49	East of Court Street	64.9	70.1	+5.2	Yes
88	East of Court Street	West of Ridge Rd	66.2	69.5	+3.3	Yes
88	West of Ridge Rd (Pine Grove)	East of Ridge Road (Pine Grove)	68.3	71.8	+3.5	Yes
88	East of Ridge Road (Pine Grove)	West of Tiger Creek Road	63.9	69.9	+6.0	Yes
88	West of Tiger Creek Road	West of Inspiration Drive	61.8	68.1	+6.3	Yes
88	West of Inspiration Drive	West of Mormon Emigrant Trail	60.4	56.9	-3.5	No
88	West of Mormon Emigrant Trail	West of Kirkwood Meadows Drive	60.6	66.9	+6.3	Yes
104	East of Sacramento	Amador County Line	57.1	66.1	+9.0	Yes
104	Amador County Line	East of Michigan Bar Road	59.6	65.1	+5.5	Yes
104	East of Michigan Bar Road	West of Jct. Rte. 124 South	63.2	68.9	+5.7	Yes
104	West of Jct. Rte. 124 South	North of SR 88	59.0	66.8	+7.8	Yes
104	North of SR 88	West of Jct. Rte. 49	60.6	67.2	+6.6	Yes
Ridge Rd	West of Jct. Rte. 49	East of Old Ridge Road	64.3	69.0	+4.7	Yes
Ridge Rd	East of Old Ridge Road	West of New York Ranch Road	63.8	70.0	+6.2	Yes
Ridge Rd	West of New York Ranch Road	West of Climax Road	62.1	69.2	+7.1	Yes
Ridge Rd	West of Climax Road	East of Climax Road	61.2	68.5	+7.3	Yes
Ridge Rd	East of Climax Road	West of SR 88	61.2	68.5	+7.3	Yes
124	West of SR 88	North of Jct. Rte. 88	60.4	62.3	+1.9	No
124	North of Jct. Rte. 88	South of Washington	61.2	64.8	+3.6	Yes
124	South of Washington	South of Sutter Ione Rd	59.1	65.4	+6.3	Yes
124	South of Sutter Ione Rd	North of Sutter Ione Rd	59.1	65.4	+6.3	Yes
124	North of Sutter Ione Rd	South of Jct. Rte. 16, Waites Station	59.3	63.8	+4.5	No
Buena Vista Road	Amador County Line	Coal Mine Road	51.3	55.0	+3.7	No
Buena Vista	Coal Mine Road	Jackson Valley Road	54.2	56.6	+2.4	No

Table 4.11-11
Predicted Traffic Noise Levels
Existing Conditions and Future 2030 General Plan Update Buildout Conditions

Roadway	Segment		L_{dn} at 100 Feet, dBA			
	From	To	Existing Conditions *	Future 2030 With Project*	Project Net Change	Significant Increase? (Impact 4.11-2)
Road						
Buena Vista Road	Jackson Valley Road	South of Highway 88	55.1	60.4	+5.3	Yes
Buena Vista Road	Highway 88	South of Highway 124	55.4	60.7	+5.3	Yes
Bunker Hill Road	New Chicago Road	South of New Chicago Road	40.0	44.1	+4.1	No
Butte Mtn Rd	Clinton Rd	Clinton Rd	50.3	53.6	+3.3	No
Camanche Parkway	San Joaquin County Line	Camanche Road	53.1	62.4	+9.3	Yes
Camanche Road	North of Camanche Parkway	Buena Vista	51.4	61.9	+10.5	Yes
Camanche Road	South of Jackson Valley Road	South of Jackson Valley Road	54.5	62.6	+8.1	Yes
Carbondale Road	North of Michigan Bar Road	Old Lambert Rd	44.6	49.5	+4.9	No
Climax Road	East of Ridge Road	West of Highway 88	54.9	57.8	+2.9	No
Climax Road	West of Highway 88	West of Highway 88	52.6	52.6	0	No
Clinton Road	North of Butte Mtn Rd	West of Butte Mtn Cutoff	49.0	52.8	+3.8	No
Eureka Road	East of Sutter Hill Rd	West of Old Ridge Road	56.2	55.6	-0.6	No
Fiddletown Road	East of Shenandoah Road	East of Hale Road	54.3	68.7	+14.5	Yes
Fiddletown Road	East of Hale Road	Shake Ridge Rd	50.0	54.3	+4.3	No
Jackson Gate Road	East of Highway 49	China Graveyard Rd	55.7	57.2	+1.5	No
Jackson Valley Rd (west)	South of SR 88	Camanche Road	50.3	54.5	+4.2	No
Jackson Valley Road	Camanche Road	East of Buena Vista	53.4	61.6	+8.2	Yes
Jackson Valley Rd (east)	East of Buena Vista	South of SR 88	54.0	64.6	+10.6	Yes
Latrobe Road	North of Highway 16	South of Old Sacramento	55.0	59.2	+4.2	No
Latrobe Road	South of Old Sacramento	At County Line	56.3	60.1	+3.8	No
Michigan Bar Road	North of Highway 16	At County Line	55.3	58.8	+3.5	No
Mt. Zion Road	South of Highway 88	South of Highway 88	48.5	55.0	+6.5	Yes
New York Ranch Road	South of Ridge Road	North of Court St	60.0	62.6	+2.6	No
Old Ridge	East of Eureka Road	North of Ridge Rd	56.3	55.8	-0.5	No

Table 4.11-11
Predicted Traffic Noise Levels
Existing Conditions and Future 2030 General Plan Update Buildout Conditions

Roadway	Segment		L_{dn} at 100 Feet, dBA			
	From	To	Existing Conditions *	Future 2030 With Project*	Project Net Change	Significant Increase? (Impact 4.11-2)
Road						
Old Sacramento Road	West of Plymouth City Limits	East of Latrobe Road	51.7	56.8	+5.1	Yes
Old Stockton Rd	North of SR 88	South of Cook Rd	46.5	49.6	+3.1	No
Rams Horn Grade	East of Volcano Road	South of Mt Rd	53.2	53.8	+0.6	No
Shakeridge Road	Pine Gulch and Oneto Road	Highway 88	56.5	60.6	+4.1	No
Shenandoah Road	North of Fiddletown Road	Near Dickson Road	59.3	62.4	+3.1	No
Shenandoah Road	Near Dickson Road	County line	58.5	61.9	+3.4	No
Shenandoah Road	At Post Mile Marker 8.00		57.5	61.3	+3.8	No
Steiner Road	North of Shenandoah Road	North of Shenandoah Road	50.5	39.1	-11.4	No
Stony Creek Road	West of Argonaut Lane	East of Buena Vista Rd	49.2	55.9	+6.7	Yes
Stony Creek Rd	East of Buena Vista Rd	East of Buena Vista Rd	54.1	58.2	+4.1	No
Sutter Creek Road	East of Pine Gulch	Main Street	51.3	56.9	+5.6	Yes

Notes: dBA = A-weighted decibels; L_{dn} = Day-Night Noise Level

Bold dBA figures exceed 60 dBA threshold used for determining the significance of Impact 4.11-3.

* Traffic noise levels are predicted at a standard distance of 100 feet from the roadway centerline and do not account for shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.

Source: Data modeled by AECOM in 2014

Based on the modeling conducted, and shown in Table 4.11-11, implementation of the Draft General Plan would result in changes in traffic noise levels ranging from -0.2 dB to +6.2 dB L_{dn}, relative to existing noise levels. The Draft General Plan considers noise effects, including traffic noise, in the placement of land use designations. Furthermore, the County seeks to reduce noise effects through the policies of the Draft General Plan Noise Element, which require application of noise standards, and generally seek to separate existing noise sources from new sensitive receptors (and existing sensitive receptors from new noise sources). The Draft General Plan also includes policies to support increased use of alternative transportation modes (including walking and transit) and to place more people in closer proximity to services and employment to reduce the number and distance of trips by each County resident. However, increased traffic would be an unavoidable effect of the projected population increase accommodated by the Draft General Plan, and traffic noise would still increase substantially at some locations in the County, especially along state highways and major collector roadways. Thus, since long-term

noise levels from project-generated vehicular traffic would result in substantial increases in ambient noise levels based on the significance criteria identified in Table 4.11-10, this impact would be **significant**.

Mitigation Measure 4.11-2: Implement ~~Draft General Plan~~ Program D-11(h)~~:~~ Noise Standards

During review of development proposals by the Land Use Agency and CEQA review, the County will apply noise standards from Tables N-3 and N-4 in the Noise Element. New developments proposing noise-sensitive land uses in areas exposed to existing or projected noise levels from transportation and other noise sources shall incorporate noise control techniques, including but not limited to those identified in Table N-2 [Table 4.11-12] to reduce noise exposure in outdoor activity areas and interior spaces to acceptable levels, as specified in Tables N-3 [Table 4.11-1] and N-4 [Table 4.11-2] of the Draft General Plan.

Responsible Agencies/Departments: Planning Department, Building Department

Time Frame: Ongoing

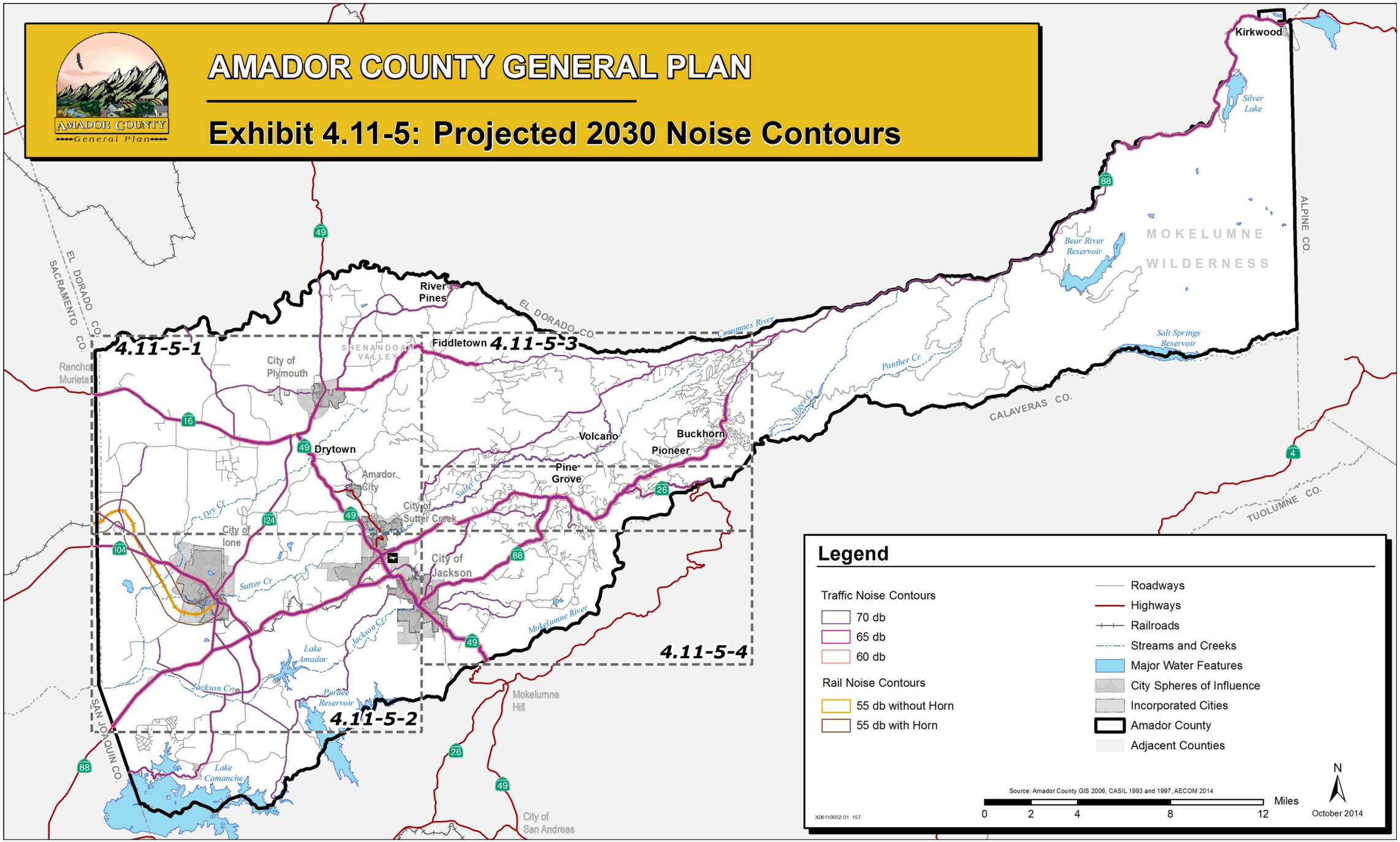
Table 4.11-12
Sample Interior Noise Control Measures

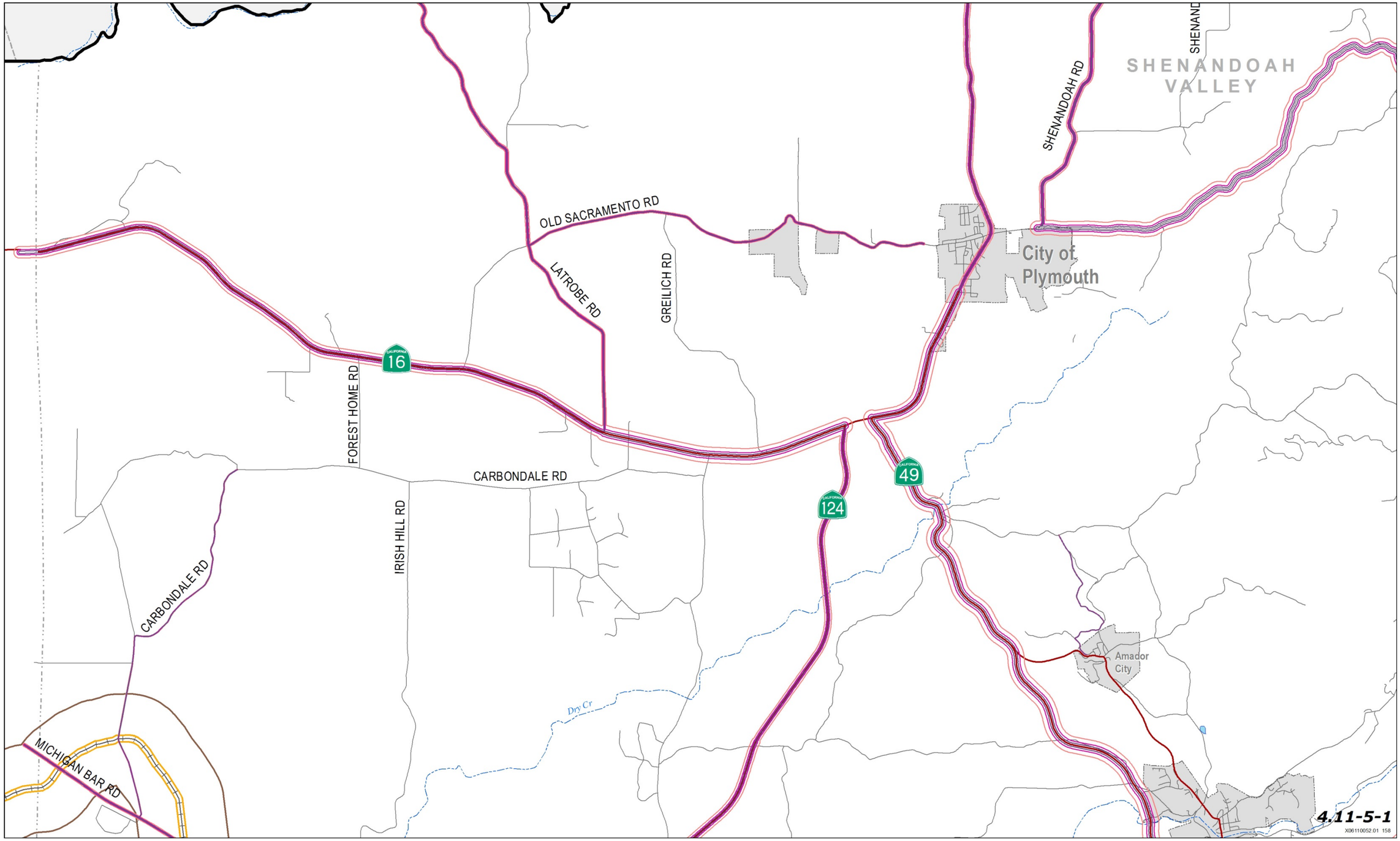
Noise Exposure Level	Exterior to Interior Noise Level Reduction (NLR) Required to Achieve 45 dBA CNEL	Noise Control Measures and Façade Upgrades
>60 dBA CNEL	15 dBA	Normal construction practices consistent with the Uniform Building Code are typically sufficient.
60 dBA to 65 dBA CNEL	20 dBA	Normal construction practices consistent with the Uniform Building Code are sufficient with the addition of the following specifications: ► Air conditioning or mechanical ventilation systems are installed so that windows and doors may remain closed. ► Windows and sliding glass doors are mounted in low air infiltration rated frames (0.5 cfm or less). ► Exterior doors are solid core with perimeter weather-stripping and threshold seals.
65 dBA to 70 dBA CNEL	25 dBA	Normal construction practices consistent with the Uniform Building Code are sufficient with the addition of the following specifications: ► Air conditioning or mechanical ventilation systems are installed so that windows and doors may remain closed. ► Windows and sliding glass doors are mounted in low air infiltration rated frames (0.5 cfm or less). ► Exterior doors are solid core with perimeter weather-stripping and threshold seals. ► Glass in both windows and exterior doors should have a Sound Transmission Classification (STC) rating of at least 30. ► Roof or attic vents facing the noise source of concern should be boxed, or provided with baffling.

Notes:
1 The information listed in this table is sample guidance for interior noise control recommendations and is not intended for application to individual development projects, renovations, or retrofits. Noise-sensitive land uses located in areas with noise level exposures exceeding 60 dBA CNEL should have a detailed acoustical analysis performed on a case by case basis.

AMADOR COUNTY GENERAL PLAN

Exhibit 4.11-5: Projected 2030 Noise Contours

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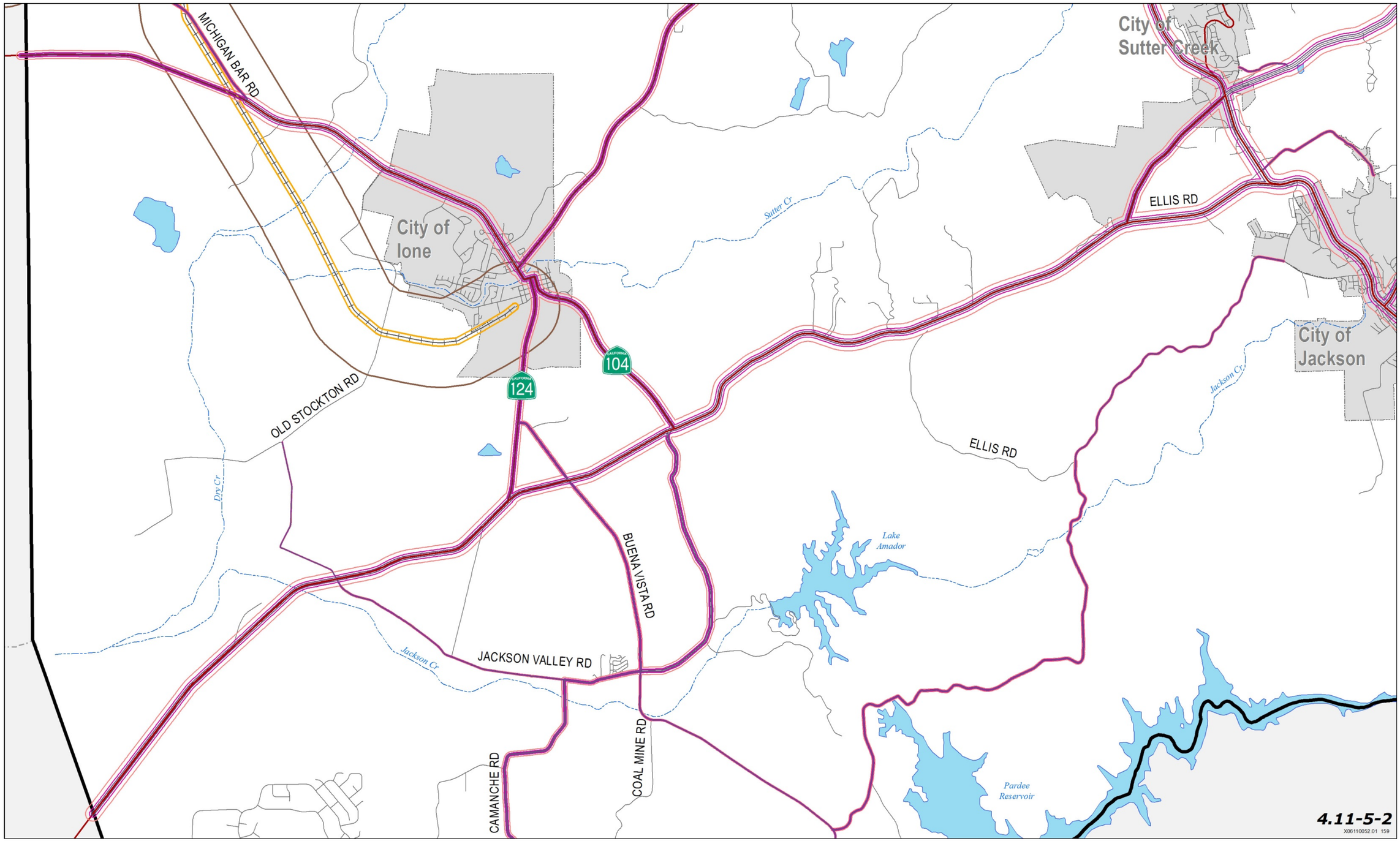
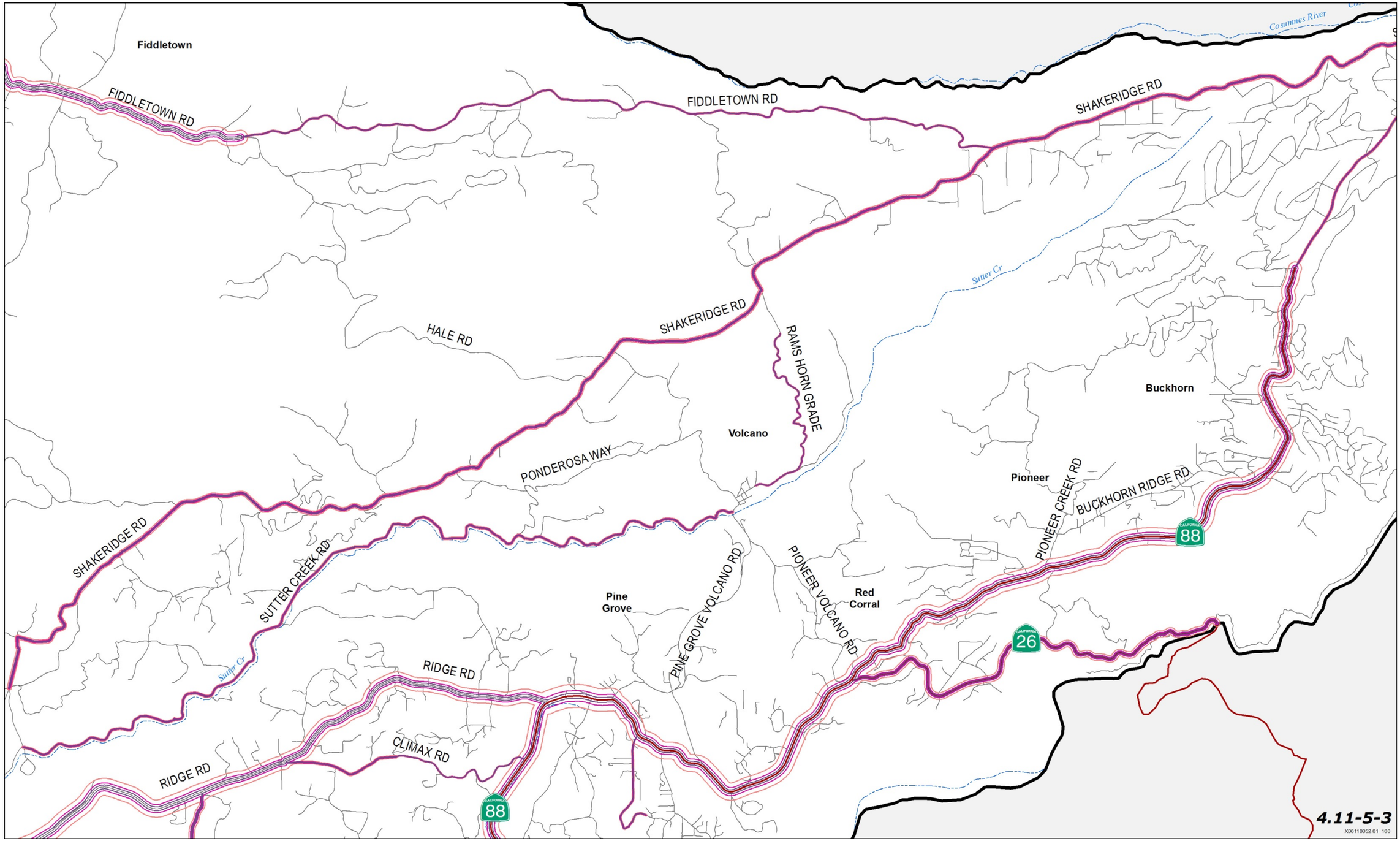
LATROBE RD
GREILICH RD
SHENANDOAH RD
SHENANDOAH VALLEY
City of Plymouth
FOREST HOME RD
CARBONDALE RD
IRISH HILL RD
CARBONDALE RD
MICHIGAN BAR RD
Dry Cr
Amador City
16
49
124
4.11-5-1
X06110052.01 158


MICHIGAN BAR RD
City of Ione
City of Sutter Creek
City of Jackson
ELLIS RD
Sutter Cr
104
124
OLD STOCKTON RD
Dry Cr
BUENA VISTA RD
JACKSON VALLEY RD
Jackson Cr
CAMANCHE RD
COAL MINE RD
Lake Amador
Pardee Reservoir
4.11-5-2
X06110052.01 159


Fiddletown
FIDDLETOWN RD
FIDDLETOWN RD
SHAKERIDGE RD
Cosumnes River
HALE RD
SHAKERIDGE RD
RAMS HORN GRADE
Sutter Cr
Buckhorn
Volcano
PONDERosa WAY
Pioneer
PIONEER CREEK RD
BUCKHORN RIDGE RD
SHAKERIDGE RD
SUTTER CREEK RD
Pine Grove
PINE GROVE VOLCANO RD
PIONEER VOLCANO RD
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RIDGE RD
CLIMAX RD
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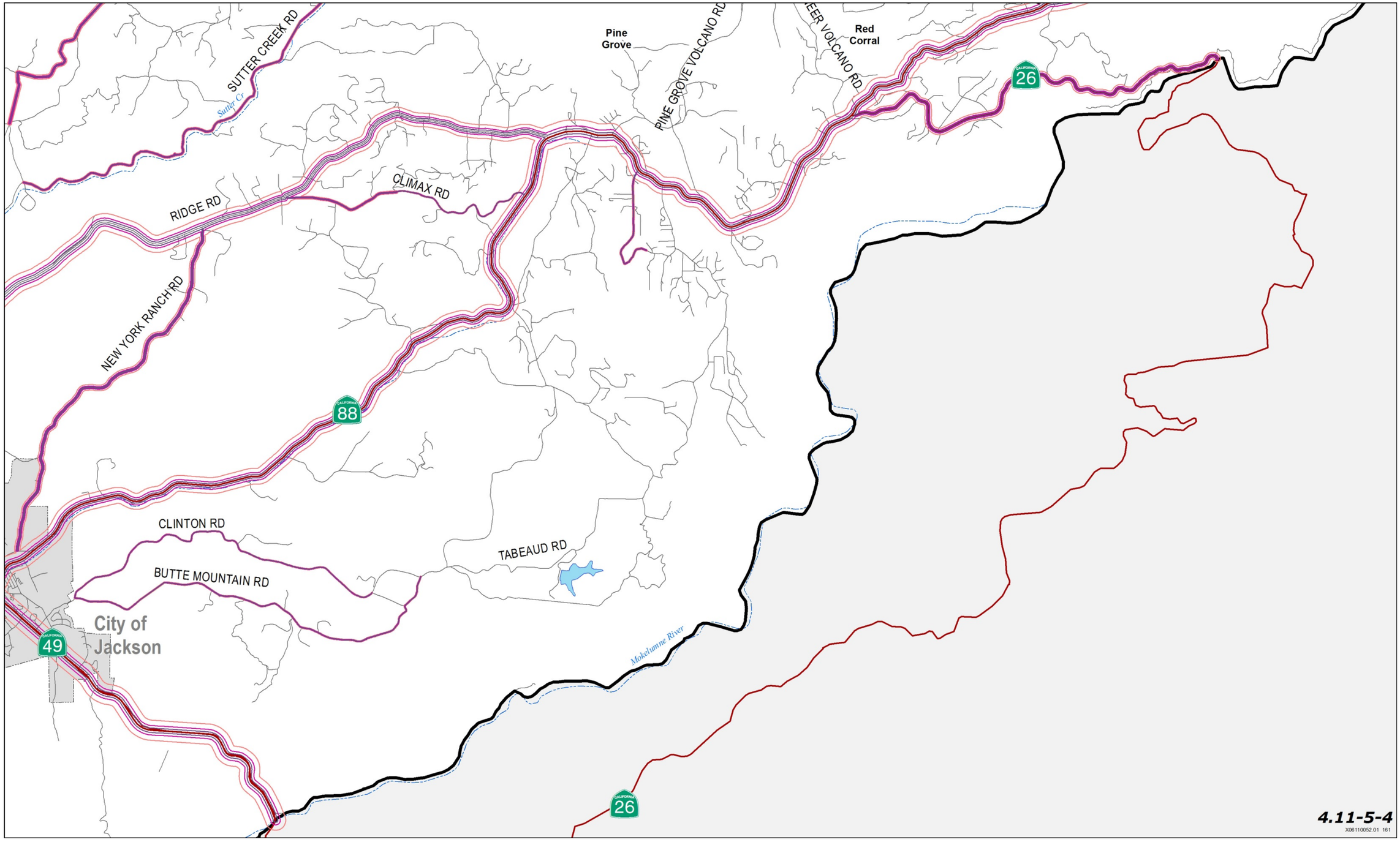
88
26
88
4.11-5-3
X06110052.01 160


SUTTER CREEK RD
Sutter Cr
Pine Grove
PINE GROVE VOLCANO RD
Red Corral
VOLCANO RD
26
RIDGE RD
CLIMAX RD
NEW YORK RANCH RD
88
CLINTON RD
TABEAUD RD
BUTTE MOUNTAIN RD
City of Jackson
49
Mokelumne River
26
4.11-5-4
X06110052.01 161

Significance after Mitigation

Implementation of Mitigation Measure 4.11-2 would reduce traffic noise impact for new potentially noise-sensitive uses; these uses would be required to reduce noise levels in accordance with the County's noise standards. In addition, individual, new development projects and transportation projects would be required to undergo project-specific environmental review. If project-level significant impacts are identified, project-specific mitigation measures would be required under CEQA.

However, increases in traffic noise would also have the potential to affect existing developed uses. Since long-term noise levels from project-generated vehicular traffic would result in substantial increases in ambient noise levels based on the significance criteria identified above in Table 4.11-10, and no additional feasible mitigation is available to reduce this impact to a less-than-significant level, this impact would remain **significant and unavoidable**.

IMPACT 4.11-3 ***Expose Noise Sensitive Receptors to Operational (Traffic) Noise Levels Exceeding Standards****. Long-term project-generated-traffic noise under the Draft General Plan could exceed OPR standards at noise-sensitive receptors. Development under the General Plan would increase traffic noise levels substantially and above applicable noise standards for sensitive receptors. This impact is* ***significant****.*

The Governor's Office of Planning and Research (OPR) has established exterior noise level guidelines of 60 to 65 dBA L_{dn} for residential and multifamily residential land use types. Other sensitive land use types have similar exterior noise level guidelines. The Draft General Plan applies exterior noise standards based on OPR's guidelines; these standards are presented in Table 4.11-1. Under 2030 conditions, the Draft General Plan would result in traffic noise levels above 60 dBA L_{dn} standard at several locations, as shown in Table 4.11-11, some of which could be near sensitive receptors such as single family residential uses.

The Draft General Plan considers noise effects, including traffic noise, in the placement of land use designations. Furthermore, the County seeks to reduce noise effects through the policies of the Draft General Plan Noise Element, which require application of noise standards, and generally seek to separate existing noise sources from new sensitive receptors (and existing sensitive receptors from new noise sources). The Draft General Plan also includes policies to support increased use of alternative transportation modes (including walking and transit) and to place more people in closer proximity to services and employment to reduce the number of vehicle trips and distance traveled by each County resident. However, increased traffic would be an unavoidable effect of the projected population increase accommodated by the Draft General Plan, and traffic noise would still exceed standards at some locations in the County, especially along state highways and major collector roadways.

Traffic noise could not necessarily be reduced to a level consistent with noise standards at each location where traffic noise would exceed standards. Table 4.11-11 summarizes modeled L_{dn} noise levels at 100 feet from the roadway centerline for affected roadway segments in the planning area under future 2030 conditions with the Draft General Plan implementation compared to existing conditions. In Table 4.11-11, a noise impact is considered significant if implementation of the Draft General Plan results in 2030 noise levels exceeding 60 dBA L_{dn}, Thus, since long-term noise levels from project-generated vehicular traffic would result in certain roadway segments to exceed 60 dBA L_{dn}, this impact would be **significant**.

Mitigation Measure: Implement Mitigation Measure 4.11-2

Significance after Mitigation

With implementation of Mitigation Measure 4.11-2, traffic noise impacts would be reduced because new potentially noise-sensitive uses would be required to adhere to the noise standards set forth in these mitigation measures. In addition, individual, new development projects and transportation projects would be required to undergo project-specific environmental review. If project-level significant impacts are identified, project-specific

mitigation measures would be required under CEQA. However, even with implementation of this program, traffic noise could exceed standards at some locations, and increases in traffic noise would also have the potential to affect existing developed uses. Since long-term noise levels from project-generated vehicular traffic would cause certain roadway segments to exceed 60 dBA L_{dn}, and no additional feasible mitigation is available to reduce this impact to a less-than-significant level, this impact would remain **significant and unavoidable**.

IMPACT 4.11-4 ***Expose Noise Sensitive Receptors to Railroad Noise Levels Exceeding Amador County Standards.*** *Long-term noise generated by railroads could exceed noise levels at existing and future noise sensitive receptors, exposing them to substantial increases in noise levels. This impact would be* ***significant****.*

Amador County's sole rail operator is Union Pacific. Union Pacific runs four daily trips (FRA 2012) through central Amador County passing through the county's western border to Ione, with three additional trips forecast as a result of the Newman Ridge project. As shown in Table 4.11-5, noise levels from trains would be approximately 65 dBA L_{dn} at 325 feet from the centerline of the tracks with the use of train horns. A doubling of daily trips is needed to increase ambient noise levels past the significance threshold of +3 dB CNEL (Caltrans 2009:4-8). Given the proximity of existing sensitive land uses to the railroad line, noise generation already exceeds accepted land-use compatibility criteria at several sensitive receptors adjacent to the tracks. The Draft General Plan designates approximately 1,300 acres for industrial uses northwest of Ione along the rail line, and additional industrial uses in this area could result in a further increase in the number of daily train trips along this rail line.

The Noise Element of the Draft General Plan includes policies intended to reduce excessive noise from all sources. The Noise Element also includes a policy specifically intended to minimize noise conflicts between current and proposed land uses and railroad corridors by protecting railroad corridors from encroachment of incompatible land uses. .

The policies included in the Draft General Plan would be applied at the project level as the County considers land use changes in the future. Although any new sensitive receptors proposed along the railroad line would be required to reduce noise exposure through project design and site planning, rail noise could exceed standards at some locations, including for existing sensitive receptors along the rail line. This impact would therefore be **significant**.

Mitigation Measure: Implement Mitigation Measure 4.11-2

Mitigation Measure 4.11-4 Implement ~~Draft General Plan~~ Program D-11(i), Noise Standards

The County will require the evaluation of railroad noise impacts for any proposed residential or other sensitive use development located within 750 feet of a railroad corridor. The evaluation shall include potential for waking associated with rail movement and horn blowing.

Responsible Agencies/Departments: Planning Department

Time Frame: Ongoing

Significance after Mitigation

With adherence to and implementation of Mitigation Measures 4.11-2 and 4.11-4~~3~~, program-level railroad noise impacts would be reduced by requiring design considerations specific to noise levels and the potential for increase in the incidence of noise due to rail traffic, both instantaneous and average daily noise levels, in order to maintain the noise level standards of the County. In addition, individual, new development projects would be required to undergo project-specific environmental review. If project-level significant impacts are identified, project-specific mitigation measures would be required under CEQA.

However, even with implementation of these measures, rail noise would exceed standards at some locations, including for existing sensitive receptors along the rail line. Thus, since long-term noise levels from rail traffic on land uses that could be permitted under the project would result in substantial increases in ambient noise levels based on the significance criteria identified above in Table 4.11-9, and no additional feasible mitigation is available to reduce this impact to a less-than-significant level, this impact would remain **significant and unavoidable**.

IMPACT 4.11-5 ***Exposure of Noise Sensitive Receptors to Stationary Source Noise Levels Exceeding Amador County Standards.*** *~~Long-term buildout of stationary- and area- source noise levels would exceed applicable standards. As a result, this impact would be **significant**.~~ Existing and future stationary sources of noise could conflict with noise standards and affect nearby sensitive receptors, exposing them to substantial increases in noise levels. This impact would be **significant**.*

The Draft General Plan provides for new development in the planning area, including buildings, structures, paved areas, roadways, utilities, and other improvements. As shown in Table 3-1 (Chapter 3, "Project Description,") the County estimates that implementation of the Draft General Plan would accommodate an additional 1,685 dwelling units and 3,922,250 square feet of non-residential (i.e., commercial, industrial, mixed use, public, and specific plans) building floor area through 2030.

As a result of increased development in the County, the numbers of noise-sensitive receptors could increase, resulting in the possibility of locating noise-sensitive receptors near noise-generating land uses. Table 4.11-8 shows that 24-hour ambient noise levels in the County ranged from 44 dBA to 63 dBA L_{dn} as measured during a community noise survey.

In addition to the specific existing stationary noise sources (including mining and industrial operations) as presented in Table 4.11-7, the Draft General Plan would accommodate a variety of land uses, including residential, commercial, office, industrial, agricultural, open space and recreation, and institutional and public facilities (e.g., electrical substations, wastewater treatment facilities and filtered water treatment facilities, and schools). The long-term operation of these uses could result in stationary and area noise from, but not limited to, the following potential sources:

- mechanical equipment (e.g., pumps, generators heating, ventilation, and cooling systems);
- landscape maintenance activities (e.g., lawn and garden equipment);
- office, commercial, and industrial noise;
- agricultural activities; and
- other noise sources.

Typical noise levels attributable to the above sources, as well as land use compatibility impacts to the County's existing and future noise-sensitive receptors are discussed below.

The Draft General Plan considers noise effects, including long-term operational sources of noise, in the placement of land use designations. Furthermore, the County seeks to reduce noise effects through the policies of the Draft General Plan Noise Element, which require applying noise standards and imposing mitigation measures on a project-by-project basis to reduce noise effects. The policies of the Draft General Plan generally seek to separate existing noise sources from new sensitive receptors (and existing sensitive receptors from new noise sources).

Commercial, Office, and Industrial Activities

Additional sources of stationary and area noise typical of commercial, office, and industrial uses include parking lots, loading dock activities, and the operation of trash compactors and air compressors. Such activities could result in intermittent noise levels of approximately 91 dB L_{max} at 50 feet (EPA 1971:57) and high single-event noise levels from backup alarms from delivery trucks during the more noise-sensitive hours of the day. Neither

the exact hours of operation nor the location of these potential noise sources are known at this time. Noise from these sources could exceed the allowable levels in Table 4.11-2 at existing and proposed noise-sensitive receptors, especially if activities were to occur during the more noise-sensitive hours (e.g., evening, nighttime, and early morning) and create a substantial increase in ambient noise levels at existing noise-sensitive receptors. In addition, if such activities were to occur during more noise-sensitive hours, project-generated noise levels may result in annoyance and/or sleep disruption. Therefore, impacts would be considered **significant.** As noted above, the Draft General Plan includes policies and standards that would condition projects to reduce noise impacts related to stationary sources, including commercial, office, and industrial activities.

Agricultural Activities

Agricultural activities throughout the County involve the use of various types of heavy-duty equipment. Agricultural operations involve crop and orchard operations, which can occur during noise sensitive times of the day and involve substantial noise levels (planting and harvesting operations can run 24-hours a day in order to maximize production of crops). The operation of heavy-duty equipment associated with agricultural activities typically results in noise levels of approximately 75 dB L_{eq} at 50 feet (EPA 1971: 11). Based on these noise levels and a typical noise-attenuation rate of 6.0 dB per doubling of distance, exterior noise levels at noise-sensitive receptors approximately 50 to 200 feet from agricultural activities could exceed 75 and 63 dB L_{eq}, respectively.

It is important to note that noise-sensitive receptors located 50 feet from agricultural activities would not be exposed to this noise level for extended periods of time, given the mobile nature of agricultural activities (e.g., disking, plowing, harvesting). If, for instance, residential land uses were exposed to 75 dB L_{eq} for one entire hour during the daytime, and ambient noise levels were 50 dB L_{eq} during the rest of the daytime hours and 45 dB L_{eq} during the nighttime hours, the 24-hour noise level would be 62 dB L_{dn}/CNEL. Nonetheless, the potential for L_{dn}/CNEL values to exceed County noise standards at residential uses due to agricultural operations would be **significant**. As noted above, the Draft General Plan includes policies and standards that would condition projects to reduce noise impacts related to conflict between agricultural activities and sensitive receptors. Furthermore, under Chapter 19.80 of the Amador County code, sounds associated with agricultural operations are not considered to represent a nuisance to adjacent or nearby land uses.

Mechanical Equipment

One potential source of stationary and area noise is the operation of mechanical equipment at residential, commercial, office, and industrial, institutional, and public facilities (e.g., electrical substations, wastewater treatment facility and filtered water treatment facility, and schools) land uses within the County. The operation of mechanical equipment (e.g., pumps, generators; heating, ventilation, and cooling systems) could result in intermittent noise levels of approximately 90 dB at 3 feet (EPA 1971:57). Based on this equipment noise level, and assuming a noise attenuation rate of 6 dB per doubling of distance from the source, operation of such equipment may result in intermittent exterior noise levels of approximately 60 dB at 95 feet.

Although these types of equipment are typically required to be shielded from direct exposure to sensitive receptors (e.g., housed on rooftops that include parapets, in equipment rooms, or in exterior enclosures at the ground level), the actual placement of such equipment on future land uses within the County is not known at this time. It is possible that noise levels could exceed the allowable levels in Table 4-11.2 at existing and proposed noise-sensitive receptors and create a substantial permanent increase in ambient noise levels at existing noise-sensitive receptors if measures are not taken to reduce such noise exposure. As a result, this impact would be **significant**. As noted above, the Draft General Plan includes policies and standards that would condition projects to reduce noise impacts related to operational noise sources, including mechanical equipment.

Landscape and Home Maintenance Activities

Landscape and home maintenance activities at various land uses (e.g., residential; commercial, office, and industrial; recreation; and schools) within the County could be another potential source of stationary and area

noise. Landscape and home maintenance activities (e.g., leaf blowers, gasoline-powered lawn mowers, power tools, and hand tools) could result in intermittent noise levels that range from approximately 80 dB for landscape activities to 85 dB at 3 feet for home maintenance activities (EPA 1971:109). Based on an equipment noise level of 85 dB, and assuming a noise attenuation rate of 6 dB per doubling of distance from the source, the use of such equipment may result in exterior noise levels of approximately 60 dB L_{eq} (the proposed Amador County daytime standard) at 50 feet and 45 dBA L_{eq} (the proposed Amador County nighttime standard) at 250 feet. Although such activities would likely occur during the daytime hours, the exact hours and locations are unknown at this time. If such activities were to occur during the more noise-sensitive hours (e.g., evening, nighttime, and early morning) noise levels could exceed the allowable levels in Table 4.11-2 at existing and proposed noise-sensitive receptors and create a substantial increase in ambient noise levels. In addition, if such maintenance activities were to occur during these more noise-sensitive hours, noise levels may result in annoyance and/or sleep disruption to occupants of the noise-sensitive land uses. As such, this impact would be **significant**. As noted above, the Draft General Plan includes policies and standards that would condition projects to reduce noise impacts related to operational noise sources, including landscaping and home maintenance activities.

Summary

Existing and future stationary sources of noise could conflict with noise standards and affect nearby sensitive receptors. This impact would be **significant**.

Mitigation Measure: Implement Mitigation Measure 4.11-2

Mitigation Measure 4.11-5a: Implement ~~Draft General Plan~~ Program D-11(c), Noise Standards

Where legally permitted, the County will require that the newest land use is responsible for mitigating noise, whether as a generator or sensitive receptor. If a new use that generates noise is proposed adjacent to lands zoned for uses that may be sensitive to noise (i.e., residential neighborhoods), then the noise-generating use is responsible for mitigating noise consistent with Noise Element Tables N-3 [Table 4.11-1] and N-4 [Table 4.11-2] standards along the property line of the affected land use. Where sensitive uses are proposed near noise sources or lands with zoning that would permit new noise sources, these new uses are responsible for mitigating their noise exposure consistent with the standards in Tables N-3 and N-4 of the Noise Element. The County seeks to protect the continued viability of economically valuable activities that produce noise (including farm operations, mining activities, commercial and industrial facilities, and airports).

Responsible Agencies/Departments: Planning Department

Time Frame: Ongoing

Mitigation Measure 4.11-5b: Implement ~~Draft General Plan~~ Program D-11(d), Noise Standards

During review of development proposals, the County will apply daytime and nighttime land use/noise environment standards at the property line of the source as shown in Table N-4 [Table 4.11-2] of the Noise Element for non-transportation sources.

Responsible Agencies/Departments: Planning Department

Time Frame: Ongoing

Mitigation Measure 4.11-5c: Implement ~~Draft General Plan~~ Program D-11(e), Noise Standards

During review of development proposals, the County will apply the standards in Table D-11-1 [Table 4.11-10]. These standards identify what changes to ambient noise levels at the property line of a sensitive receptor will be considered to be significant noise increases. Land uses within the County that are

considered to be noise-sensitive include any residential property or residential unit located within a vertical mixed-use development on a single-parcel, residential divisions of land, residential land use designations, schools, churches, hospitals, care facilities, libraries, and auditoriums.

Responsible Agencies/Departments: Planning Department

Time Frame: Ongoing

Mitigation Measure 4.11-5d: Implement ~~Draft General Plan~~ Program D-11(f), Noise Standards

During review of development proposals by the Land Use Agency and CEQA review, the County will apply the noise standards identified in Table N-3 [Table 4.11-1], as measured at the property line. These standards limit acceptable periodic noise increases to the levels shown in Table D-11-2 [Table 4.11-13].

Responsible Agencies/Departments: Planning Department

Time Frame: Ongoing

Table 4.11-13
Allowable Increases in Hourly Ambient Noise Levels

Period of Noise Level Increase	Allowable Increase
Cumulative period of 30 minutes per hour	0 dB L_{eq}
Cumulative period of 15 minutes per hour	5 dB L_{eq}
Cumulative period of 5 minutes per hour	10 dB L_{eq}
Cumulative period of 1 minutes per hour	15 dB L_{eq}
Not be exceeded at any time	20 dB L_{eq}

Note: CNEL = community noise equivalent level; dB = decibels; L_{dn} = day-night average noise level
Sources: Federal Interagency Committee on Noise. 1992 (August). *Federal Agency Review of Selected Airport Noise Analysis Issues*. Washington, DC. Page 3-5.

Significance after Mitigation

Implementation of Mitigation Measures 4.11-2, 4.11-5a, 4.11-5b, 4.11-5c, and 4.11-5d, would reduce noise levels attributable to stationary sources. However, it may not be feasible for some projects to achieve the County's noise standards or the allowable increases in Table 4.11-10 or allowable hourly increase in Table 4.11-13, of this EIR, (60 dBA L_{eq} daytime, 45 dBA L_{eq} nighttime) at noise sensitive receptors. No additional feasible mitigation is available to reduce this impact to a less-than-significant level. Therefore, this impact would remain **significant and unavoidable**.

IMPACT 4.11-6 ***Expose People Residing or Working within an Airport Land Use Plan or Within 2 miles of a Public Airport or Public Use Airport, or in the Vicinity of a Private Airstrip to Excessive Noise Levels.*** *Long-term noise generated by airports could exceed noise level limits at existing and potential future sensitive receptors located in proximity. This impact would be* ***significant.***

Amador County has one public airport, Westover Field, and several small private airports (Eagle's Nest and other private airstrips). Thirteen operations per day are permitted at Eagle's Nest; other small private strips would have similar or lower volumes of air traffic. No noise conflicts would therefore be expected at these locations.

Westover Field operations are regulated by the Airport Master Plan (last updated in 2007). The airport has a maximum 230 fixed base aircraft ceiling. Noise contours are established in the Airport Land Use Compatibility Plan, and are illustrated in Exhibit 4.11-1.

There are currently several sensitive receptors within Westover Field's 60 dBA L_{dn} noise contour along Sutter Creek Road and Old Ridge Road. The Draft General Plan includes several policies that would require that development in the vicinity of airports be compatible with noise standards in Table N-3 of the Draft General Plan [Table 4.11-1] and include appropriate mitigation to achieve those levels.

However, over the course of the planning horizon, new development could potentially occur or be proposed within the 65 dBA L_{dn} airport noise contour, and therefore could subject these potential uses to noise levels in excess of acceptable standards. As a result, impacts would be considered **significant**.

Mitigation Measure: Implement Mitigation Measures 4.11-2, 4.11-5a, and 4.11-5b

Mitigation Measure 4.11-6: Implement ~~Draft General Plan~~ Program D-11(j), Noise Standards

The County will require that development proposals in the vicinity of airports/airstrips, including Westover Field and Eagle's Nest Airport, demonstrate compatibility with current and projected airport noise levels for each facility (including the Airport Land Use Plan) in accordance with the noise standards presented in Table N-3 [Table 4.11-1] of the Draft General Plan.

Responsible Agencies/Departments: Planning Department

Working With: Airport Land Use Commission

Time Frame: Ongoing

Significance after Mitigation

Implementation of Mitigation Measures 4.11-2, 4.11-5a, 4.11-5b, and 4.11-6 would ~~reduce impacts~~ prevent people and workers from being exposed to excessive airport noise levels ~~associated with airport noise to a less-than-significant level~~ because future noise sensitive uses proposed within the 65 CNEL contour of an airport would be required to consider noise generated at any nearby airports and incorporate design measures to insure that the noise standards associated with such uses, especially interior standards, would be achieved. This impact would be reduced to less than significant after mitigation.

IMPACT 4.11-7 ***Expose Persons to or Generate Excessive Groundborne Vibration or Groundborne Noise Levels.*** *Short-term project-generated construction source vibration levels could exceed Caltrans' recommended standard of 0.2 in/sec peak particle velocity (PPV) with respect to the prevention of structural damage for normal buildings and the FTA maximum acceptable vibration standard of 80 vibration decibels (VdB) with respect to human response for residential uses (i.e., annoyance), at vibration-sensitive land uses. However, vibration from vehicular traffic and industrial and commercial operations would not exceed Caltrans and FTA recommended standards. This impact would be* ***significant****.*

Amador County consists of mostly rural and suburban environments. Groundborne noise and vibration would be generated by industrial operations (including underground mining and quarries), railroads, and traffic. Groundborne vibration levels associated with industrial operations, freight rail and roadway traffic rarely exceed criteria established for evaluation of building damage or human annoyance (Caltrans 2004: 13-18). Additionally, short-term intermittent groundborne noise and vibration may be generated by construction activities.

Construction-Induced Vibration

Construction activities have the potential to result in varying degrees of temporary ground vibration, depending on the specific construction equipment used and operations involved. Ground vibration levels associated with various types of construction equipment are summarized below in Table 4.11-14. Based on the representative vibration levels presented for various construction equipment types, sensitive receptors located in proximity to construction operations could be exposed to groundborne vibration levels exceeding the recommended FTA and Caltrans guidelines of 80 VdB and 0.2 in/sec PPV, respectively when located within 500 feet and 300 feet of impact pile drivers and within 70 feet and 45 feet of large bulldozers (and other heavy-duty construction equipment). As a result, this impact is considered **significant**.

Table 4.11-14
Representative Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 feet (in/sec)[1, 3]	Approximate L_v (VdB) at 25 feet[2]
Pile Driver (impact)	Upper range	1.518	112
	Typical	0.644	104
Pile Driver (sonic)	Upper range	0.734	105
	Typical	0.170	93
Large Bulldozer		0.089	87
Caisson Drilling		0.089	87
Heavy-duty Trucks		0.076	86
Jackhammer		0.035	79
Small Bulldozer		0.003	58

Notes:
1 Where PPV is the peak particle velocity.
2 Where L_v is the RMS velocity expressed in vibration decibels (VdB), assuming a crest factor of 4.
3 Vibration levels can be approximated at other locations and distances using the above reference levels and the following equation: PPV equip = PPV ref (25/D)1.1 (in/sec); where "PPV ref" is the given value in the above table, "D" is the distance for the equipment to the new receiver in feet.
Source: Federal Transit Administration 2006

Vehicular Traffic-Induced Vibration

Vehicles traveling on the local and regional roadway network are generally supported by flexible suspension systems, and therefore, are not substantial sources of ground vibration. However, vehicles can cause vibration when rolling over paved surfaces that are not smooth. These discontinuities typically develop as a result in cracking, potholes, or misaligned expansion joints caused by settling pavement sections or gaps in support structures of a span, due to normal geological conditions or fault activity. When these discontinuities develop, vehicles passing over the imperfection impart energy into the ground, generating vibration. Groundborne vibration levels from automobile traffic are generally dominated by vibration generated by heavy trucks that roll over the same uneven roadway surfaces.

The FTA has established a screening level distance of 50 feet for heavy-duty vehicles (e.g. buses) to determine impact to sensitive receptors (FTA 2006: 9-4). Due to the rapid drop-off rate of groundborne vibration and the short duration of the associated events, vehicular traffic-induced groundborne vibration is rarely perceptible outside the roadway right-of-way, especially given roadway widths of 24-48 feet within the County and typical setbacks on housing lots of greater than 20 feet.

Implementation of the Draft General Plan does not propose the construction or realignment of any major roadway projects. Additionally, it is not anticipated that land use changes associated with implementation of the General Plan would result in the exposure of persons within the planning area to groundborne vibration levels exceeding the FTA and Caltrans guidelines of 80 VdB and 0.2 in/sec PPV. As a result, this impact is considered **less than significant**.

Industrial and Commercial Operations

Industrial and commercial operations have, on occasion, been known to utilize equipment or processes in the manufacture and distribution of materials that have a potential to generate groundborne vibration. However, vibrations found to be excessive for human exposure that are the result of a manufacturing process or industrial machinery are generally addressed from an occupational health and safety perspective. The residual vibrations from industrial processes or machinery are typically of such low amplitude that they quickly dissipate into the surrounding soil and are rarely perceivable at the surrounding land uses. Distribution of materials to and from industrial and commercial land uses can have the potential to generate more substantial levels of groundborne vibration than that of the mechanical equipment. In consideration of deliveries and distributions occurring by heavy truck, the loading and unloading operations benefit from the resiliency of the flexible suspension systems and pneumatic tires, which substantially limit the effect and transfer of energy to the ground. Heavy truck traffic passing over uneven roadway surfaces can impart energy into the ground and induce groundborne vibration; however, heavy trucks used for delivery and distribution of materials to and from industrial and commercial sites generally operate at very low speeds while on the industrial or commercial site. Therefore, the groundborne vibration induced by heavy truck traffic at industrial or commercial land uses is not anticipated to be perceptible at distances greater than 25 feet (typical distance from roadway centerline to edge of roadway right-of-way for a single-lane road). Impacts would be **less than significant**.

Mining Operations

Mining operations (surface and underground) use heavy duty equipment, blasting, crushing, conveyors, and other miscellaneous equipment used for removal and transportation of minerals. Operations at mines have a potential to generate groundborne vibration, and blasting operations would generate the highest level of mining vibration. However, blasting vibration can vary based on the blasting event (i.e., blasting charge and local geology), and vibration dissipates rapidly with distance.

Based on the operational and location characteristics of existing mines, and existing and proposed sensitive receptors, it is unlikely that any sensitive receptors would be located in proximity of active mining operations as a result of the Draft General Plan. However, as future locations of future activities at mines within the County are not known at this time, it may be possible for receptors to be located in proximity of mining operations that could subject such receptors to elevated vibration levels that would exceed FTA and Caltrans vibration thresholds. As a result, this impact is considered **significant**.

Mitigation Measure 4.11-7a: Construction Vibration Setbacks

The County will require that development proposals that would potentially generate construction vibration in proximity to vibration sensitive receptors (structures and humans), employ appropriate setback distances for operating construction equipment and vehicles to reduce vibration levels below the recommended FTA and Caltrans guidelines of 80 VdB and 0.2 in/sec PPV, respectively when located within 500 feet and 300 feet of impact pile drivers, and within 70 feet and 45 feet of large bulldozers (and other heavy-duty construction equipment). Construction vibration impact and mitigation, including site-specific setback distances based on the project's anticipated vibration would be determined during project-specific CEQA review.

Responsible Agencies/Departments: Planning Department, Building Department, Department of Transportation and Public Works

Time Frame: Ongoing

Mitigation Measure 14.11-7b: Mining Operation Vibration Setbacks

The County will require mining development proposals that would potentially generate vibration in proximity to vibration sensitive receptors (structures and humans), to employ appropriate setback distances for operating construction equipment and vehicles to reduce vibration levels below the recommended FTA and Caltrans guidelines of 80 VdB and 0.2 in/sec PPV, respectively. Vibration impact and mitigation, including site-specific setback distances based on the project's anticipated vibration, would be determined during project-specific CEQA review

Responsible Agencies/Departments: Planning Department

Time Frame: Ongoing

Significance after Mitigation

With ~~adherence to FTA and Caltrans vibration guidelines and~~ implementation of Mitigation Measures 4.11-7a and 4.11-7b, program-level vibration impacts from construction and mining would be **less than significant**. <u>These mitigation measures would assure that people are not exposed to excessive groundborne vibration.</u> Individual, new projects would be required to undergo project-specific environmental review. If project-level significant impacts are identified, setback distances would be required under CEQA to meet the performance standards in Mitigation Measures 4.11-7a and 4.11-7b.