E. NOISE

This section assesses the effects of the Draft General Plan on the noise element of Yolo County. The following discussion describes the general characteristics of sound and the categories of audible noise and the regulatory framework related to noise issues at the County, State and federal levels is then described. Lastly, potential noise impacts associated with the growth anticipated under the Draft General Plan are evaluated, and mitigation measures are recommended as necessary.

1. Setting

This section describes the characteristics of sound, existing noise sources, existing noise level characteristics throughout the County, and the noise regulatory framework.

a. Characteristics of Sound. Noise is generally defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: *pitch* and *loudness*. Pitch is the number of complete vibrations or cycles per second of a wave that results in the range of tone from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment, and it is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments and accurately modeled. The noise environment of a project area is defined in terms of sound intensity and potential effects on adjacent sensitive land uses.

(1) Measurement of Sound. Sound is characterized by various parameters that describe the rate of oscillation (frequency) of sound waves, the distance between successive troughs or crests in the wave, the speed that it travels, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize the loudness (or amplitude) of an ambient sound, and the decibel (dB) scale is used to quantify sound intensity. Because sound can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale[1] is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all pitches (sound frequencies) within the entire spectrum, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity in a process called "A-weighting," expressed as "dBA." The dBA or A-weighted decibel refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA.

As noted above, sound levels in dB are calculated on a logarithmic basis. Changes of 3 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3 dB or more; this change in noise level has been found to be barely perceptible to the

[1] Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale, representing points on a sharply rising curve. The logarithmic decibel scale allows an extremely wide range of acoustic energy to be characterized in a manageable notation.

human ear in outdoor environments. An energy change of approximately a factor of 10 is required for the human auditory system to perceive a doubling of noise loudness. Therefore, a 10 dBA increase in the level of a continuous noise represents a perceived doubling of loudness, while a 20 dBA increase is 100 times more intense, and a 30 dBA increase is 1,000 times more intense. As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level. Noise levels diminish or attenuate as distance from the source increases based on an inverse square rule, depending on how the noise source is physically configured. Noise level from a single-point source, such as a single piece of construction equipment at ground level, attenuates at a rate of 6 dB for each doubling of distance (between the single-point source of noise and the noise-sensitive receptor of concern). Heavily traveled roads with few gaps in traffic behave as continuous line sources and attenuate roughly at a rate of 3 dB per doubling of distance.

Planning for acceptable noise exposure must take into account the types of activities and corresponding noise sensitivity in a specified location for a generalized land use type. The noise levels presented herein are expressed in terms of dBA, unless otherwise indicated. Table IV.E-1 contains a list of typical acoustical terms and definitions that quantify the effects of community noise on people, depending on the energy of the noise and what time of day the noise occurs. Table IV.E-2 shows some representative noise sources and their corresponding noise levels in dBA.

Table IV.E-1: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of level that denotes the ratio between two quantities proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels equaled or exceeded by a fluctuating sound level for 1 percent, 10 percent, 50 percent, and 90 percent of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of five decibels to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, 1991.

Table IV.E-2: Typical A-Weighted Sound Levels

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments
Near Jet Engine	140	Deafening
Civil Defense Siren	130	Threshold of pain
Hard Rock Band	120	Threshold of feeling
Accelerating Motorcycle at a Few Feet Away	110	Very loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very loud
Ambulance Siren; Food Blender	95	Very loud
Garbage Disposal	90	Very loud
Freight Cars; Living Room Music	85	Loud
Pneumatic Drill; Vacuum Cleaner	80	Loud
Busy Restaurant	75	Moderately loud
Near Freeway Auto Traffic	70	Moderately loud
Average Office	60	Moderate
Suburban Street	55	Moderate
Light Traffic; Soft Radio Music in Apartment	50	Quiet
Large Transformer	45	Quiet
Average Residence Without Stereo Playing	40	Faint
Soft Whisper	30	Faint
Rustling Leaves	20	Very faint
Human Breathing	10	Very faint

Source: Compiled by LSA Associates, Inc., 2008.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq}, the community noise equivalent level (CNEL), and the day-night average level (L_{dn}) based on A-weighted decibels (dBA). CNEL is the time varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events occurring during the evening relaxation hours. CNEL and L_{dn} are within one dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours. Typical A-weighted sound levels from various sources are described in Table IV.E-2. While the County's General Plan states that either metric may be used for exterior or interior noise impact analysis, for purposes of this analysis the primary noise metric used is L_{dn}.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of maximum levels denoted by L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions, and addresses the annoying aspects of intermittent noise.

Noise standards in terms of percentile exceedance levels, L_n, are often used together with the L_{max} for noise enforcement purposes. When specified, the percentile exceedance levels are not to be exceeded by an offending sound over a stated time period. For example, the L_{10} noise level represents the level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level.

The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the lowest noise level experienced during a monitoring period. It is normally referred to as the background noise level. For a relatively steady noise, the measured L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first is audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3.0 dBA or greater, since, as described earlier, this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1.0 and 3.0 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise level of less than 1.0 dB that are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

(2) Psychological and Physiological Effects of Noise. Five major categories of adverse noise effects are summarized below.

Hearing Loss. According to the World Health Organization (WHO) noise studies,[2] environmental noise could lead to hearing impairment, particularly after long-term occupational exposure, as well as after shorter-term exposure at very high noise levels (for example, exposure several times a year to concert noise at 100 dBA). According to the U.S. Department of Housing and Urban Development's 1985 Noise Guidebook (see also Table IV.E-2 above), permanent physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 to 90 dBA. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. For avoiding adverse effects on human physical and mental health in the workplace or in communities, the U.S. Department of Labor, Occupation Health and Safety Administration (OSHA) requires the protection of workers from hearing loss when the noise exposure equals or exceeds an 8-hour time-weighted average of 85 dBA.[3]

Other Health Effects. Exposure to high noise levels is thought to affect the entire human system. In addition to hearing loss, WHO identified other potential health effects such as hypertension and heart disease (after many years of constant exposure to high noise levels in excess of 75 dBA). Noise is thought to adversely affect the nervous system, as well as trigger emotional reactions like anger, depression, and anxiety.

Sleep Disturbance. Sleep disturbance caused by noise is variable and hard to characterize, because of the difficulty in determining the quality of sleep. According to WHO,[4] sleep disturbance can occur when continuous indoor noise levels exceed 30 dBA or when intermittent interior noise

[2] World Health Organization, Guidelines for Community Noise, Geneva, 1999. Available on the internet at: http://www.who.int/docstore/peh/noise/guidelines2.html. The World Health Organization (WHO) is considered the best source of current knowledge regarding health impacts. This is because the European nations have continued to study noise and its health effects, while the U.S. Environmental Protection Agency (EPA) all but eliminated its noise investigation and control program in the 1970's.

[3] Occupational Safety & Health Administration. Regulations, Standards 29 CFR, Occupational Noise Exposure 1910.95.

[4] Ibid.

levels reach 45 dBA, particularly if background noise is low. The WHO's Guidelines for Community Noise criteria suggest for minimum sleep disturbance exterior ambient nighttime noise levels should be 45 dBA or below, and short-term events should not generate noise in excess of 60 dBA. WHO also notes that maintaining noise levels within the recommended levels during the first part of the night is believed to be effective for the ability to fall asleep.[5]

Interference with Speech and Learning. Interference with speech is another adverse affect of noise at schools and elsewhere. The duration of speech interference depends on the time above L_{max} levels. Speech interference may occur outdoors when the sound level is 60 to 65 dBA or higher. (This is a conservative benchmark, since normal voice sentence intelligibility is 95 percent with a steady background level of 65 dBA.) Speech interference may occur indoors, with the windows open, when the outdoor sound level is 70 to 75 dBA or higher. Speech interference may occur indoors, with the windows closed, when the outdoor sound level is 75 to 80 dBA or higher.

Interference with speech at schools is another adverse affect of noise. Noise can disrupt speech intelligibility at relatively low levels; for example, in a classroom setting, a noise level as low as 35 dBA can disrupt clear understanding. Sentence intelligibility drops dramatically when steady sound levels exceed 65 dBA. Other potential health effects of noise, identified by WHO, include decreased performance on complex cognitive tasks, such as reading, attention, problem solving, and memorization.

Annoyance. Unwanted community effects of noise occur at levels much lower than those that cause hearing loss and other health effects. Annoyance to noise occurs when it interferes with sleeping, conversation, noise-sensitive work, including learning or listening to radio, television, or music. WHO reports that, during daytime hours, few people are seriously annoyed by activities with noise levels below 55 dBA, or moderately annoyed with noise levels below 50 dBA.[6] It should be noted, however, that annoyance is not a significance criteria for determining noise impacts for the purposes of this EIR.

(3) Characteristics of Groundborne Vibration. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings. As the vibration propagates from the foundation throughout the remainder of the building, the vibration of floors and walls may cause perceptible vibration from the rattling of windows or a rumbling noise. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. When assessing annoyance from groundborne noise, vibration is typically expressed as root mean square (rms) velocity in units of decibels of 1 micro-inch per second. To distinguish vibration levels from noise levels, the unit is written as "VdB." Human perception to vibration starts at levels as low as 67 VdB. Annoyance due to vibration in residential settings starts at approximately 70 VdB. Groundborne vibration is almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without the effects associated with the shaking of the building, the motion does not provoke the same adverse human reaction.

In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. The damage threshold for buildings considered of particular historical significance or that

[5] Ibid.

[6] Ibid.

are particularly fragile structures is approximately 96 VdB; the damage threshold for other structures is 100 VdB.[7] Common sources of groundborne vibration include trains and construction activities such as blasting, pile driving, and operating heavy earthmoving equipment. Typical vibration source levels from construction equipment are shown in Table IV.E-3.

Table IV.E-3: Typical Vibration Source Levels for Construction Equipment

Equipment		Approximate VdB at 25 feet
Pile Driver (impact)	Upper range	112
	Typical	104
Pile Driver (sonic)	Upper range	105
	Typical	93
Clam shovel drop (slurry wall)		94
Hydromill (slurry wall)	In soil	66
	In rock	75
Vibratory roller		94
Hoe ram		87
Large bulldozer		87
Caisson drilling		87
Loaded trucks		86
Jackhammer		79
Small bulldozer		58

Source: Federal Transit Administration, 2006. *Transit Noise and Vibration Impact Assessment.* May.

b. Existing Noise Environment. Noise sources that affect the baseline noise levels throughout the County are described below.

(1) Existing Traffic Noise. Existing traffic noise levels along highway and roadway segments throughout the County were calculated using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA RD-77-108). This model requires parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. Traffic data used in the noise prediction model were obtained from the traffic impact analysis prepared by Fehr & Peers for this EIR. The resultant noise levels were weighted and summed over 24-hour periods to determine the day-night average level (L_{dn}) values; L_{dn} is the 24 hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.

Table IV.E-4 lists the traffic noise model results for the freeways and highways in the County under the existing traffic conditions; Table IV.E-5 lists the traffic noise model results for the County roads under existing conditions. Appendix E contains the modeling worksheets for the noise analysis.

(2) Existing Aircraft Noise. There are four airports located within the County; in addition, Sacramento International Airport, which is situated outside of Yolo County, generates noise that affects county lands due to fight paths over Yolo County. The following analysis is based on the noise contours for each of these airports that are shown on pages HS-40 and HS-41 of the Health and Safety Element of the Draft General Plan.

- Yolo County Airport is owned by Yolo County and serves Davis, Woodland, Winters and the wider county area. The facility is located about 6 miles from Davis, Woodland and Winters.
- Watts-Woodland Airport is a privately-owned aviation facility located west of Woodland.
- University Airport is owned by the University of California and serves the City of Davis and Yolo County. The facility is located about two miles south of the City of Davis.
- Borges-Clarksburg Airport is a privately-owned airport just north of Clarksburg. According to airport staff, airplane activity is variable, but typically very minimal, averaging one flight per day.
- This airport does not affect ambient noise in the County, as the 65 CNEL line lies within the privately-owned property.

[7] Harris, C.M. 1998. *Handbook of Acoustical Measurements and Noise Control.*

Table IV.E-4: Existing Highway Traffic Noise Levels

Roadway Segment	ADT[a]	Center-line to 70 L_{dn}[b] (feet)	Center-line to 65 L_{dn} (feet)	Center-line to 60 L_{dn} (feet)	L_{dn} (dBA) 100 feet from Centerline
Interstate 80					
State Route 50 to County Road 32A	55,400	189	402	864	75.2
Mace Boulevard to Solano County Line	44,200	164	347	743	74.2
Interstate 5					
Sacramento County Line to County Road 102	21,100	101	212	455	71.2
State Route 113 to County Road 13	12,200	72	148	316	68.8
County Road 13 to Interstate 505	7,700	< 50[c]	110	233	66.8
Interstate 505 to Colusa County Line	10,400	66	134	284	68.1
Interstate 505					
State Route 128 to State Route 16	4,900	< 50	83	173	64.8
State Route 16 to County Road 14	3,000	< 50	62	126	62.7
State Route 113					
Solano County Line to Covell Boulevard	22,700	105	223	477	71.5
Covell Boulevard to Gibson Road	15,300	83	172	367	69.8
Interstate 5 to County Road 17	3,200	< 50	65	131	63.0
County Road 17 to County Road 13	900	< 50	< 50	< 50	56.2
County Road 13 to Sutter County Line	1,500	< 50	< 50	59	58.5
State Route 16					
County Road 98 to County Road 94B	10,000	< 50	97	208	66.7
County Road 94B to Interstate 505	9,700	< 50	95	204	66.6
Interstate 505 to County Road 87	8,400	< 50	86	185	65.9
County Road 87 to County Road 78	6,700	< 50	74	160	65.0
State Route 128					
Interstate 505 to Winters	9,300	< 50	66	142	64.2
Winters to County Road 86	7,000	< 50	76	164	65.1
State Route 84					
Clarksburg Road to West Sacramento	1,600	< 50	< 50	62	58.7
West Sacramento to State Route 50	18,900	69	148	318	69.5
State Route 50 to Interstate 80	14,700	58	125	269	68.4
State Route 45					
State Route 113 to Country Road 98A	700	< 50	< 50	< 50	55.1

[a] Average Daily Traffic.
[b] The 24 hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
[c] Traffic noise levels within 50 feet of roadway centerline requires site specific analysis.
Source: LSA Associates, Inc., 2009.

Table IV.E-5: Existing County Roadway Traffic Noise Levels

Roadway Segment	ADT[a]	Center-line to 70 L_{dn} (feet)	Center-line to 65 L_{dn} (feet)	Center-line to 60 L_{dn} (feet)	L_{dn} (dBA) 100 feet from Centerline
County Road 85 - State Route 16 to County Road 14	400	< 50	< 50	< 50	48.6
County Road 85 - County Road 14 to County Road 8	100	< 50	< 50	< 50	42.6
County Road 87 - State Route 16 to County Road 19	200	< 50	< 50	< 50	45.6
County Road 89 - County Road 29A to County Road 27	1,100	< 50	< 50	< 50	53.0
County Road 89 - County Road 27 to County Road 24A	1,300	< 50	< 50	< 50	53.8
County Road 89 - County Road 24A to State Route 16	1,000	< 50	< 50	< 50	52.6
County Road 94B - State Route 16 to County Road 19	600	< 50	< 50	< 50	50.4
County Road 98 - Solano County to County Road 31	2,400	< 50	< 50	58	56.4
County Road 98 - County Road 31 to County Road 29	3,300	< 50	< 50	71	57.8
County Road 98 - County Road 29 to County Road 27	4,000	< 50	< 50	81	58.6
County Road 98 - County Road 27 to County Road 24	5,200	< 50	< 50	97	59.8
County Road 98 - County Road 24 to State Route 16	7,800	< 50	59	126	61.5
County Road 98 - Main Street to Interstate 5	4,600	< 50	< 50	89	59.2
County Road 99 - County Road 31 to County Road 27	1,800	< 50	< 50	< 50	55.2
County Road 99 - County Road 27 to Gibson Road	3,100	< 50	< 50	68	57.5
County Road 101A - West Covell Boulevard to County Road 29	2,400	< 50	< 50	58	56.4
County Road 102 - East Covell Boulevard to County Road 29	6,500	< 50	52	112	60.7
County Road 102 - County Road 29 to County Road 27	5,600	< 50	< 50	101	60.1
County Road 102 - County Road 27 to Gibson Road	4,900	< 50	< 50	93	59.5
County Road 102 - Gibson Road to Interstate 5	11,900	< 50	78	167	63.4
County Road 102 - Interstate 5 to County Road 17	4,900	< 50	< 50	93	59.5
County Road 102 - County Road 17 to County Road 113	6,100	< 50	< 50	107	60.5
County Road 105 - County Road 32A to County Road 28H	600	< 50	< 50	< 50	50.4
Old River Road - County Road 127 to County Road 118	3,900	< 50	< 50	80	58.5
Russell Boulevard - Interstate 505 to County Road 31	4,400	< 50	< 50	86	59.0
County Road 31 - County Road 93A to County Road 95	3,900	< 50	< 50	80	58.5
County Road 31 - County Road 95 to County Road 98	4,900	< 50	< 50	93	59.5
County Road 29A - Interstate 505 to County Road 95	300	< 50	< 50	< 50	47.4
County Road 29 - County Road 95 to County Road 98	600	< 50	< 50	< 50	50.4
County Road 29 - State Route 113 to County Road 102	4,000	< 50	< 50	81	58.6
County Road 28H - County Road 102 to County Road 105	700	< 50	< 50	< 50	51.1
County Road 27 - Interstate 505 to County Road 95	900	< 50	< 50	< 50	52.2
County Road 27 - County Road 95 to County Road 98	1,100	< 50	< 50	< 50	53.0
County Road 27 - County Road 98 to State Route 113	1,700	< 50	< 50	< 50	54.9
County Road 24 - County Road 90 to County Road 95	800	< 50	< 50	< 50	51.6
County Road 24 - County Road 95 to County Road 98	2,100	< 50	< 50	53	55.8
County Road 23 - County Road 85B to County Road 89	1,100	< 50	< 50	< 50	53.0
County Road 19 - County Road 87 to Interstate 505	700	< 50	< 50	< 50	51.1
County Road 19 - Interstate 505 to County Road 94B	600	< 50	< 50	< 50	50.4
County Road 16A - Interstate 5 to State Route 113	300	< 50	< 50	< 50	47.4
County Road 17 - State Route 113 to County Road 102	1,100	< 50	< 50	< 50	53.0
County Road 14 - County Road 85 to Interstate 505	400	< 50	< 50	< 50	48.6
County Road 14 - Interstate 505 to Interstate 5	900	< 50	< 50	< 50	52.2
County Road 13 - Interstate 5 to State Route 113	1,100	< 50	< 50	< 50	53.0
County Road 12A - County Road 85 to Interstate 505	100	< 50	< 50	< 50	42.6
County Road 12A - Interstate 505 to County Road 99W	100	< 50	< 50	< 50	42.6

[a] Average Daily Traffic.
[b] Traffic noise levels within 50 feet of roadway centerline requires site specific analysis.
Source: LSA Associates, Inc., 2009.

Sacramento International Airport is a large, commercial airport located just west of the Yolo County line, providing hundreds of daily domestic and international departures. Although located in Sacramento County, noise from the operation of this airport impacts Yolo County.

The Sacramento Area Council of Governments (SACOG) has been designated the Airport Land Use Commission (ALUC) for the counties of Sacramento, Sutter, Yolo, and Yuba. SACOG has prepared a Comprehensive Land Use Plan (CLUP) for the Sacramento International Airport, Yolo County Airport, Watts-Woodland Airport, and Borges-Clarksburg Airport. The University Airport is required to have an Airport Layout Plan (ALP) which has been prepared by UC Davis. The purpose of these plans is to protect public health and safety by adopting land use standards that minimize exposure to safety hazards and excessive levels of noise, and to prevent the encroachment of incompatible land uses around airports per the Airport Land Use Commission Law.

(3) Existing Railroad Noise. Yolo County has three active rail lines, one of which, the Union Pacific Railroad line, carries both freight and passenger trains. The train noise contours were calculated following Federal Transportation Administration guidelines: *Transit Noise and Vibration Impact Assessment*, 2006 and are summarized in Table IV.E-6.

Table IV.E-6: Train Noise Contours

Railroad Line	Centerline to 65 dBA L_{dn} (feet)	Noise Level (dBA L_{dn}) 100 feet from center of rail line
Union Pacific	930	89
California Northern	11	45
Sacramento River Train	10	44

Source: LSA Associates, Inc., 2009.

Union Pacific Railroad (UPRR). The UPRR maintains a rail line that runs through Yolo County from West Sacramento to Davis. The rail line carries both freight trains and Amtrak passenger trains. According to Union Pacific personnel,[8] 35 daily freight train passages typically occur on the line. Freight train lengths vary widely, from as few as four to as many as 120 rail cars and from two to eight locomotives, operating at an average speed of 70 miles per hour.

Amtrak passenger rail service also uses the UPRR rail line. An average of 21 daily eastbound trains and 21 daily westbound trains utilize the line. Each train typically uses four rail cars and one locomotive per train, traveling an average speed of 79 miles per hour. Assuming all trains could be operating on the high end of the estimates provided, calculations were made using this worst case scenario. Thus, assuming 35 daily freight trains (30 daytime and 5 nighttime operations), each with eight locomotives and 120 rail cars traveling at 70 miles per hour, and 42 daily passenger trains, each with one locomotive and four cars traveling at 79 miles per hour, the estimated combined railroad noise levels at 100 feet from the railroad centerline is approximately 89 dBA L_{dn}. The estimated distance to the 65 dBA L_{dn} contour is 930 feet for this worst case condition for freight and passenger train operations on the UPRR rail line.

California Northern Railroad Company. The California Northern rail line is a freight line that runs through Davis and Woodland, and along Interstate 5 past Dunnigan. The freight line schedule varies depending on seasonal demands. The rail line carries an average of two trains daily, using between one and 50 rail cars and one or two locomotives, traveling at an average speed of 15 mile per hour. The estimated railroad noise level at 100 feet from the railroad centerline is

[8] Jones & Stokes, 2005. *Yolo County General Plan Update Background Report*. January.

approximately 45 dBA L_{dn}. The estimated distance to the 65 dBA L_{dn} contour is 11 feet from the rail line.

Sacramento River Train. The Sacramento River Train is operated by the Sierra Northern Railroad Company as an entertainment passenger train that runs from Woodland to West Sacramento. According to Sierra Northern Railroad personnel, typically one round trip runs per day. The trains typically have between two and 25 rail cars with one or two locomotives, traveling at an average speed estimated at 15 miles per hour.[9] Assuming the worst case of two daily train bypasses, each with 25 cars and two locomotive traveling at 15 miles per hour, the estimated railroad noise levels at 100 feet from the railroad centerline is approximately 44 dBA L_{dn}. The estimated distance to the 65 dBA L_{dn} contour is 10 feet from the rail line.

(4) Existing Stationary Noise. Stationary noise sources in the County include farming, mining, industry and food processing, and construction.

An LSA noise technician conducted short-term (20 minute) ambient noise monitoring at 12 locations chosen by the County on Tuesday and Wednesday, August 19 and 20, 2008, between the hours of 9:00 a.m. and 2:00 p.m. while the identified facilities were in operation. The locations and the results of the noise monitoring effort are shown in Tables IV.E-7 and IV.E-8. Maximum and minimum noise levels were recorded as well as the equivalent continuous noise level L_{eq}. In addition to the locations listed in these tables, it was determined that operational ambient noise levels at the Clark Pacific concrete plant in Woodland range up to 75 dBA L_{dn} at 100 feet from the batch plant.[10]

Farming. Noise sources related to farming activity in Yolo County are primarily day and nighttime diesel pump operations, day and nighttime harvesting, crop-dusting aircraft, and bird deflection devices. Typical noise levels from tractors as measured at a distance of 50 feet range from 78 dBA to 106 dBA L_{max}, with an average of about 84 dBA L_{max}.[11]

Mining. Mining activities in Yolo County typically are comprised of sand and gravel extraction operations, and are limited to locations along the Cache Creek corridor that are generally isolated from residential development and other sensitive land uses. Primary noise sources associated with mining activities include heavy equipment operations for material extraction, processing activities and material trucking. Table IV.E-9 provides a summary of typical noise levels produced by common mining operations, although the actual noise generated from mining activities will vary based on the type and intensity of the operations. Seven facilities of this type utilizing loading and batching, excavation, and other mining operations, were monitored for noise during their daytime operations. The locations and the results are shown in Tables IV.E-7 and IV.E-8. Monitoring results indicate the noise levels for mining in Yolo County range from 59.5 dBA to 78.3 dBA L_{eq} at or near the facilities' property lines.

[9] David Magaw, President, Sierra Northern Railway. Personal Communication with Jones and Stokes, October 12, 2004.

[10] [1]This noise monitoring data taken from *Initial Study/Mitigated Negative Declaration Zone File #2007-078, Clark Precast, LLC's "Sugarland" Project*. February 22, 2008.

[11] Bolt, Beranek & Newman, 1987. *Noise Control for Buildings and Manufacturing Plants*.

Table IV.E-7: Short-Term Ambient Noise Monitoring Locations and Primary Noise Sources

Site #	Facility	Monitoring Location	Primary Noise Sources
1	RH Phillips - (winery) 26800-44 County Road 12A	18 feet east of parking lot entrance, 22 feet west of steam boilers	Compressor, steam boilers
2	Granite - Esparto (sand and gravel mine), 15560 County Road 87	142 feet southeast of rock plant	Rock plant operations, bull dozer
3	Teichert - Esparto (sand and gravel mine), 27940-44 County Road 19A	39 feet south of end of parking lot, 54 feet northeast of machinery	Gravel equipment/ machinery
4	Cemex - Madison (sand and gravel mine), 30288 State Route 16	36 feet southwest of asphalt loading ramp, 98 feet south of asphalt plant	Asphalt plant (rock plant not in operation)
5	Syar Gravel Mine - Madison (sand and gravel mine) – 16560 County Road 89	65 feet southeast of sand plan, 92 feet south of gravel plant	Sand plant, soft gravel plant, occasional trucks/loaders
6	Mariani – Winters (agriculture processing), 30455 County Road 31	82 feet southwest of transporting tunnel, 96 feet southeast of warehouse & cylinder processors	Processing at warehouse & materials moving through tunnels
7	Teichert - Woodland (sand and gravel mine), 35460-68 County Road 20	62 feet southwest of rock plant, 122 feet south of sand plant	Rock & sand plant operations
8	Pirmi - Woodland (rice mill), 854 Kentucky Avenue	27 feet south of Tank 51, 42 feet east of Tank 8, 82 feet southeast of Pit 4	Operations in Pit 4, processing
9	Syar - Woodland (batch plant), 39820 Kentucky Avenue	96 feet west of fuel tanks, 46 feet northwest of batch plant	Batch plant operations, on-site trucks
10	Medland Field Airport - Davis (private airport), 41155-71 County Road 27	48 feet north of driveway, 4 feet east of end of runway	Maintenance operations in hangar, on-site trucks
11	County Land Fill - Davis (solid waste disposal), 44082-90 County Road 28H	144 feet north of landfill	Equipment operating in landfill, trucks

Source: LSA Associates, Inc., 2009.

Table IV.E-8: Short-Term Ambient Noise Monitoring Results

Site Number	Date	Start Time	dBA L_{eq}	dBA L_{max}	dBA L_{min}
1	8/19/08	9:00 a.m.	66.3	82.7	62.4
2	8/19/08	9:55 a.m.	59.5	76.5	53.0
3	8/19/08	10:55 a.m.	71.2	77.1	68.3
4	8/19/08	12:05 p.m.	78.3	89.9	67.0
5	8/19/08	12:55 p.m.	74.0	85.7	54.0
6	8/19/08	1:45 p.m.	75.5	87.2	55.5
7	8/20/08	10:20 a.m.	76.6	79.3	73.7
8	8/20/08	11:05 a.m.	82.0	86.7	74.4
9	8/20/08	11:40 a.m.	64.5	82.4	61.2
10	8/20/08	12:55 p.m.	56.2	72.8	36.2
11	8/20/08	1:28 p.m.	75.2	91.2	64.1

Source: LSA Associates, Inc., 2009.

Yolo County has adopted the Cache Creek Area Plan (CCAP) which includes the Off Channel Mining Plan (OCMP) for Lower Cache Creek[12] which includes the following noise standards:

- 80 dBA-L_{eq} at property boundaries (6:00 a.m. to 6:00 p.m.)
- 60 dBA-L_{eq} at off-site residences or noise-sensitive uses (6:00 a.m. to 6:00 p.m.)

[12] Yolo County, 1996. *Final Off-Channel Mining Plan for Lower Cache Creek.* July 30.

- 65 dBA-L_{eq} at property boundaries (6:00 p.m. to 6:00 a.m.)

As stated previously, seven mining locations were monitored during their daytime operations, primarily within or near to the property boundaries. Each facility was found to be operating within the 80 dBA-L_{eq} standard set out by the OCMP.

Table IV.E-9: Noise Produced by Typical Mining Operations

Activity	Range of Maximum Sound Levels (dBA at 50 feet)	Suggested Maximum Sound Levels for Analysis (dBA at 50 feet)	Suggested Maximum Sound Levels for Analysis (dBA at 500 feet)
Loading and Batching	80 to 85	83	63
Rock Plant Operations	87 to 103	98	78
Excavator/Haul Truck	83 to 94	88	68
Scrapers	83 to 91	87	67

Source: Bolt, Beranek & Newman, 1987. *Noise Control for Buildings and Manufacturing Plants.*

Other Commercial/Industrial Facilities. Food processing, winery, olive oil processing, and other commercial/industrial facilities are also a source of noise in Yolo County. Mechanical equipment and trucking are the primary sources of noise associated with these facilities. Associated trucking trips on County roads are accounted for in the traffic noise analysis conducted for the EIR.

(5) Existing Construction Noise. Construction is on going in Yolo County as new development and redevelopment takes place. Two types of short-term noise are emitted during construction. First, construction crew commutes and the transport of construction equipment and materials to construction sites incrementally increase noise levels on access roads leading to the sites. Although there is the potential for a relatively high single event noise exposure causing intermittent noise nuisance (e.g., passing trucks at 50 feet would generate up to a maximum of 86 dBA L_{max}), the effect on longer term (hourly or daily) ambient noise levels is minimal. Second, noise is generated during excavation, grading, and erection of buildings. Construction typically occurs in discrete steps, each of which has a distinctive mix of equipment and, consequently, distinctive noise characteristics. These various sequential phases change the character of the noise generated on each site and, therefore, the noise levels surrounding these sites as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction related noise ranges to be categorized by work phase. Table IV.E-10 lists typical construction equipment noise levels recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor.

Table IV.E-10: Typical Construction Equipment Maximum Noise Levels, L_{max}

Type of Equipment	Range of Maximum Sound Levels (dBA at 50 feet)	Suggested Maximum Sound Levels for Analysis (dBA at 50 feet)
Pile Drivers	81 to 96	93
Rock Drills	83 to 99	96
Jackhammers	75 to 85	82
Pneumatic Tools	78 to 88	85
Pumps	68 to 80	77
Scrapers	83 to 91	87
Haul Trucks	83 to 94	88
Electric Saws	66 to 72	70
Portable Generators	71 to 87	80
Rollers	75 to 82	80
Dozers	85 to 90	88
Tractors	77 to 82	80
Front-End Loaders	86 to 90	88
Hydraulic Backhoe	81 to 90	86
Hydraulic Excavators	81 to 90	86
Graders	79 to 89	85
Air Compressors	76 to 89	85
Trucks	81 to 87	85

Source: Bolt, Beranek & Newman, 1987. *Noise Control for Buildings and Manufacturing Plants.*

c. Regulatory Framework. The following section summarizes the regulatory framework related to noise, including federal, State and County of Yolo plans, policies and standards.

Federal, state, and local government each have some responsibility for providing environmental noise control. The Office of Noise Control at the California Department of Health Services published guidelines for evaluating the compatibility of various land uses as a function of community noise exposure and created a model community noise ordinance. The *Land Use Compatibility for* Community Noise Environments chart and the components of the Model Community Noise Control Ordinance are both provided in the Background Report[13] for this EIR. State-level noise control regulations apply to new multi-family residential construction through the California State Building Code (Title 24 of the California Code of Regulations), which establishes standards for building design that will limit maximum L_{dn} or CNEL noise levels to 45 dBA in any habitable room.

Other State and federal means of noise control include noise limits for transportation sources in the California Vehicle Code and highway noise abatement criteria from the Federal Highway Administration and the California Department of Transportation. The Federal Aviation Regulation Part 150 Airport Noise Compatibility Program is designed to reduce the effect of airport noise on the surrounding communities as airports expand, and Title 21 of the California Code of Regulations establishes noise standards for airports and sets forth the responsibilities of the regional Airport Land Use Commissions, which prepare land use compatibility plans with thorough evaluation of airport noise.

(1) Federal Regulations - U.S. Environmental Protection Agency (EPA). In 1972 Congress enacted the Noise Control Act. This act authorized the EPA to publish descriptive data on the effects of noise and establish levels of sound "requisite to protect the public welfare with an adequate margin of safety." These levels are separated into health (hearing loss levels) and welfare (annoyance levels), as shown in Table IV.E-11. The EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels.

Table IV.E-11: Summary of EPA Noise Levels

Effect	Level	Area
Hearing loss	$L_{eq}(24) \leq 70$ dB	All areas.
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq}(24) \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} \leq 45$ dB	Indoor residential areas.
	$L_{eq}(24) \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Source: U.S. Environmental Protection Agency, 1974. "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety." March.

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to an $L_{eq(24)}$ of 70 dB. The "(24)" signifies an L_{eq} duration of 24 hours. The EPA activity and interference guidelines are designed to ensure reliable speech communication at about 5 feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

[13] Jones & Stokes, op. cit., p. 5-10 through 5-11.

(2) State Regulations. The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standard," it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL.

State law (Section 65302f of the Government Code) mandates that the Noise Element analyze and quantify, to the extent practicable, current and projected noise levels for all of the following sources:

- Highways, freeways.
- Primary arterials and major local streets.
- Passenger and freight on-line railroad operations and ground rapid transit systems.
- Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operations.
- Local industrial plants, including, but not limited to, railroad classification yards.
- Other ground stationary sources identified by local agencies as contributing to the community noise environment.

That same section of the Government Code State law also requires the County to recognize the State Noise Element Guidelines, and provide noise contours for all of the noise sources listed above using CNEL or L_{dn} measurement levels based on monitoring or acceptable modeling. The noise contours are to be used to assist with land use planning so that exposure to excessive noise can be minimized. The noise element must include actions that avoid existing and foreseeable noise problems, and address the State's noise insulation standards.

(3) Local Regulations. The Yolo County Municipal Code and the Cache Creek Area Plan contain local regulations related to noise analysis.

Yolo County Cache Creek Area Plan. The Off-Channel Mining Plan for Lower Cache Creek (OCMP) and the Cache Creek Resources Management Plan for Lower Cache Creek (CCRMP) together comprise the Cache Creek Area Plan (CCAP). The CCAP includes policies for managing noise impacts due to mining activities along Cache Creek. Among the goals of the plan is to promote coordination of local, State, and federal regulation of activities within Cache Creek. The OCMP was established as a comprehensive and integrated planning framework for regulating and protecting the

Cache Creek area. The CCRMP is a comprehensive management plan that eliminated commercial in-channel aggregate mining, established an improvement program from implementing on-going projects to improve channel stability, and ensured restoration of riparian habitat along creek banks in the future. The policies related to reducing noise impacts resulting from mining activities are also included under Title 10 of the Yolo County Code[14] and are described next.

Yolo County Code. The County addresses noise in the ordinances and policies of the County Code. Applicable County codes related to noise are:

Title 6. Sanitation and Health. Chapter 1 of this ordinance prohibits owners from permitting their animals, except domestic cats, from habitually making loud noises, which constitutes a public nuisance.

Title 8. Land Development and Zoning. Article 1 of Chapter 2 of this ordinance requires that land uses permitted within the M-L zoning areas must confine noise emissions to the premises of such land use and all uses must be completely confined within enclosed buildings. The chapter further describes the uses permitted within the M-1 and M-2 zoning areas provided the use is consistent with the intent of the zoning area and not objectionable by reason of adverse noise.

Article 2 of the zoning chapter prohibits home occupants from producing noise to a degree greater than that normal for the neighborhood in which it is located. Through the permitting process, this chapter also prohibits noise from increased animal densities from resulting in a nuisance condition to surrounding properties.

Chapter 5 establishes the County's trip reduction requirements for employers/developers located in unincorporated areas of the County of Yolo, including the objective to reduce traffic-related noise from levels that would otherwise occur within the County.

Title 9. Parks and Recreation. Article 5 of Chapter 3 prohibits the operation or maintenance of motor vehicles in any manner which causes excessive noise or threatens the public peace, health, and safety.

Title 10. Environment. Chapters 3 and 4 outline the County's in-channel and off-channel mining standards. According to the in-channel maintenance mining standards, noise levels are not permitted to exceed an average noise level equivalent of 80 dBA L_{eq} measured at the outermost boundaries of the parcel being excavated. In addition, noise levels may not exceed an average noise level equivalent of 60 dBA L_{eq} at any nearby residences or other noise-sensitive land uses, unless emergency conditions require otherwise as determined by the Director. Furthermore, the chapter also suggests that vegetated buffers be placed between restored habitat areas and adjoining farmland to, among other things, reduce the effects of noise generated by agricultural operations on wildlife and riparian vegetation.

The County's off-channel surface mining standards state that from 6:00 a.m. to 6:00 p.m., noise levels are not permitted to exceed an average noise level equivalent of 80 dBA L_{eq} measured at the property boundaries of the site, and noise levels shall not exceed an average noise level equivalent of 60 dBA L_{eq} for any nearby off-site residences or other noise-sensitive land uses. Additionally, noise levels shall not exceed an average noise level equivalent of 65 dBA L_{eq} measured at the property boundaries

[14] Yolo County, 2008. *Yolo County Code.*

of the site between 6:00 p.m. and 6:00 a.m. Further, at no time shall noise levels exceed a community noise equivalent level (CNEL) of 60 dBA for any existing residence or other noise-sensitive land use. An existing residence shall be considered the property line of any residentially zoned area or, in the case of agricultural land, any occupied off-site residential structures. Achieving the noise standards may involve setbacks, the use of quieter equipment adjacent to residences, the construction of landscaped berms between mining activities and residences, or other appropriate measures.

Chapter 4 also mandates that operators provide acoustical analysis for future truck and traffic noise associated with the individual operations along County roadways identified as experiencing significant impacts due to increased traffic noise.

Chapter 8 reiterates the noise standards of off-channel mining as also being applicable to agricultural mining and reclamation. The chapter further requires that soil and/or material stockpiles associated with agricultural mining operations must be located a minimum of 500 feet from public rights-of-way, public recreation areas, and off-site residences, unless alternate measures to reduce potential noise impacts are developed and implemented.

2. Draft 2030 Countywide General Plan for Yolo County

The following is a list of relevant Draft General Plan goals, policies, and actions related to noise:

Health and Safety Element

- Policy HS-7.1: Ensure that existing and planned land uses are compatible with the current and projected noise environment. However, urban development generally experiences greater ambient (background) noise than rural areas. Increased density, as supported by the County in this General Plan, generally results in even greater ambient noise levels. It is the County's intent to meet specified indoor noise thresholds, and to create peaceful backyard living spaces where possible, but particular ambient outdoor thresholds may not always be achievable. Where residential growth is allowed pursuant to this general plan, these greater noise levels are acknowledged and accepted, notwithstanding the guidelines in Figure HS-7.
- Policy HS-7.2: Ensure the compatibility of permitted land use activities within the Primary Delta Zone with applicable noise policies of the Land Use and Resource Management Plan of the Delta Protection Commission.
- Policy HS-7.3: Protect important agricultural, commercial, industrial, and transportation uses from encroachment by land uses sensitive to noise and air quality impacts.
- Policy HS-7.4: For proposed new development, where it is not possible to reduce noise levels in outdoor activity areas to 60 dB CNEL or less using practical application of the best-available noise reduction measures, greater exterior noise levels may be allowed, provided that all available reasonable and feasible exterior noise level reduction measures have been implemented.
- Policy HS-7.5: Minimize the impact of noise from transportation sources including roads, rail lines, and airports on nearby sensitive land uses.
- Policy HS-7.6: Support improvements to at-grade crossings to eliminate the need for train whistle blasts in, near, or through communities.
- Policy HS-7.7: Encourage railroad companies to adopt operational strategies that reduce the potential for noise and interrupted traffic flow.
- Policy HS-7.8: Encourage local businesses to reduce vehicle and equipment noise through fleet and equipment modernization or retrofits, use of alternative fuel vehicles and installation of mufflers or other noise reducing equipment.
- Action HS-A61: Adopt a comprehensive Noise Ordinance that includes the following components:

  - Standards for acceptable exterior and interior noise levels, their applicability and any specific exceptions to those standards.
  - Guidelines and technical requirements for noise measurements and acoustical studies to determine conformance with provisions of the ordinance.
  - Standards for construction equipment and noise-emitting construction activities.
  - Regulations for the noise generated by events, including truck loading and unloading, operation of construction equipment, and amplified music. (Policy HS-7.1, Policy HS-7.4, Policy HS-7.5)

- Action HS-A62: Regulate the location and operation of land uses to avoid or mitigate harmful or nuisance levels of noise to the following sensitive receptors: residential uses, hospitals and nursing/convalescent homes, hotels and lodging, and appropriate habitat areas. (Policy HS-7.1, Policy HS-7.4)
- Action HS-A63: Review proposed development projects for compatibility with surrounding and planned uses in accordance with the Noise Compatibility Guidelines; however these guidelines shall not be applied to outdoor activity areas nor shall they be used to prohibit or preclude otherwise allowed density and intensity of development. (Policy HS-7, Policy HS-7.4)
- Action HS-A64: Require the preparation of a noise analysis/acoustical study, including recommendations for attenuation, for all proposed projects which may result in potentially significant noise impacts to nearby sensitive land uses. (Policy HS-7.1, Policy HS-7.4)
- Action HS-A65: Require a noise analysis/acoustical study, with recommendations for attenuation, for all proposed development within noise-impacted areas that may reasonably be expected to be exposed to levels that exceed the appropriate Noise Compatibility Guidelines standards. (Policy HS-7.1, Policy HS-7.4)
- Action HS-A66: Require architectural design and site planning techniques to meet interior and outdoor activity area noise attenuation requirements in a manner that does not discourage allowed density or intensity, architectural quality, or pedestrian connectivity, such as:
  - Locating noise-sensitive interior spaces, such as living rooms and bedrooms, furthest from noise sources.
  - Orienting buildings to shield noise sensitive outdoor spaces from a noise source.
  - Using noise insulating windows and building materials.
  - Provide open space, berms or walls, or landscaped areas between occupied dwellings and noise generators.
  - Locate dwellings as far as possible from noise generators.
  - Require effective sound barriers for new residential developments adjacent to existing freeways and highways.
  - The construction of sound walls is discouraged and where used shall be screened with vegetation, berms, and similar methods of mitigation, and where used, shall be screened with a landscape buffer. (Policy HS-7.1, Policy HS-7.4)
- Action HS-A67: Limit land uses, consistent with adopted Comprehensive Land Use Plans (CLUP), within identified airport safety zones. (Policy HS-7.1)
- Action HS-A68: Refer proposed development projects within areas requiring airport land use compatibility review to the Airport Land Use Commission. (Policy HS-7.1)
- Action HS-A69: Designate appropriate zoning that avoids placing significant new noise sensitive land uses in proximity of existing or planned commercial and industrial uses. (Policy HS-7.1)
- Action HS-A70: Minimize noise conflicts between current and proposed transportation networks by encouraging compatible land uses around critical segments with higher noise potential. (Policy HS-7.1)
- Action HS-A71: Designate and maintain established truck routes where noise conflicts with land uses are least likely to occur. (Policy HS-7.1, Policy HS-7.5)
- Action HS-A72: Identify locations and work with the California Department of Transportation to mitigate freeway noise that adversely affects unincorporated residential land uses. (Policy HS-7.5)

- Action HS-A73: Minimize potential noise conflicts by establishing compatible land uses and larger setbacks adjoining truck routes and other critical transportation corridors that tend to generate greater levels of noise. (Policy HS-7.1, Policy HS-7.5)
- Action HS-A74: Where feasible, utilize alternative road surfacing materials that minimize vehicle noise. (Policy HS-7.1, Policy HS-7.5)

3. Impacts and Mitigation Measures

This section evaluates potential noise impacts associated with implementation of the Draft General Plan, and recommends mitigation measures. It establishes the thresholds of significance for impacts and then evaluates the Draft General Plan. Where potentially significant impacts of the proposed project are identified, mitigation measures are recommended.

a. Significance Criteria. The Draft General Plan would result in a significant noise impact if it would:

- Expose persons to or generate noise levels in excess of normally acceptable State and County standards;
- Result in a substantial permanent increase in ambient noise levels (for the purposes of this analysis a 5 dB change in ambient noise levels is considered significant);
- Result in a substantial temporary or periodic increase in ambient noise levels, such as an increase caused by construction activity or agricultural operations, above acceptable levels for the source;
- Expose persons to or generate excessive vibration;
- Expose people residing or working in an area of the County to excessive aircraft noise levels.
- Substantially conflict with applicable plans, policies and regulations of other agencies where such conflict would result in an adverse physical change in the environment;
- Result in new policies that would result in significant adverse physical impacts as compared to the 1983 General Plan policies.

b. Impacts Analysis. Noise impacts related to implementation of the Draft General Plan are discussed as follows.

(1) Exposure to Noise in Excess of Standards. Significant long-term noise impacts that could be experienced as a result of implementation of the Draft General Plan include increased traffic noise levels on roadway segments throughout the County.

Impact NOI-1: Increased traffic from build-out of the proposed Draft General Plan would result in a significant increase in traffic noise levels on roadway segments throughout the County. (S)

The FHWA highway traffic noise prediction model (FHWA RD-77-108) was used to evaluate existing and future traffic noise conditions on highways and roadways throughout the County. The resultant noise levels were weighed and summed over a 24-hour period in order to determine the L_{dn} values. Traffic volumes were used from the traffic analysis prepared for the Draft General Plan. Tables IV.E-4 and IV.E-5 show the existing modeled highway and County roadway traffic noise levels respectively.

Cumulative traffic noise levels for highways and County roadways assuming build-out under the existing 1983 General Plan are shown in Tables IV.E-12 and IV.E-13 respectively; while traffic noise levels for highways and County roadways under cumulative conditions including build-out of the Draft General Plan are shown in Tables IV.E-14 and IV.E-15. Model input assumptions are provided in Appendix E.

A significant impact would occur if build-out of the Draft General Plan would result in a substantial permanent increase of 5 dBA or greater in ambient noise levels above those without the project. Modeling results indicate that traffic noise levels on three modeled highway segments would decrease slightly with the project; for three segments traffic noise levels would remain the same; while for the rest of the modeled highway segments traffic noise levels would increase slightly. The greatest traffic noise increase on highway segments in the County resulting from build-out of the Draft General Plan would occur on Interstate 505 from State Route 16 to Interstate 5, with an increase of 4.0 dBA over the without the project conditions. All the modeled highway segments would experience a less than 5 dBA increase in traffic noise levels with implementation of the project. Therefore, implementation of the proposed project would result in a less-than-significant increase in traffic noise levels on all highways throughout the County.

However, modeling results also indicate that, with build-out of the Draft General Plan, three of the modeled County roadway segments would experience significant increases in traffic noise levels as compared to cumulative conditions without the project. As shown in Table IV.E-15, the impacted roadway segments and resulting traffic noise increases are as follows:

- County Road 85 from State Route 16 to County Road 14, 5.4 dBA increase;
- County Road 88 from County Road 24 to State Route 16, 9.1 dBA increase; and
- County Road 19 from County Road 87 to Interstate 505, 6.0 dBA increase.

Therefore, build-out of the Draft General Plan would result in a substantial permanent increase in ambient noise levels of 5 dBA or greater on County roadways as compared to those that would occur under build-out of the 1983 General Plan. Although these impacted roadway segments are in rural areas of the County, there are existing residential land uses within 100 feet of the centerline of these roadway segments.

It is the County's policy, as stated in Policy HS-7.5, to minimize the impact of noise from transportation sources on nearby sensitive land uses. Actions HS-A63 and HS-A65 address applicable land use compatibility standards and required noise analysis/acoustical studies for proposed development of noise sensitive land uses in noise-impacted environments. Actions HS-A70, HS-A72, and HS-A73 also seek to minimize noise conflicts between transportation networks and sensitive land use development. Action HS-A74 requires the Planning and Public Works Department to utilize alternative road surfacing materials, where feasible, that reduce vehicle noise.

While the noise policies of the Draft General Plan would ensure that future discretionary development would analyze the potential for noise impacts and incorporate appropriate noise reduction features, not all future growth would be subject to discretionary approval, and/or may rely on this EIR and subsequent site-level technical studies and resource inventories. Policy CC-3.1 of the Draft General Plan requires that specific plans be prepared for primary growth areas in the County. Policy CC-4.11 ensures that all applications for development are accompanied by appropriate site specific information to allow for assessment of the potential for site-specific impacts.

Table IV.E-12: Cumulative (2030) Highway Traffic Noise Levels With Build-Out of 1983 General Plan

Roadway Segment	ADT[a]	Center-line to 70 L_{dn} (feet)	Center-line to 65 L_{dn} (feet)	Center-line to 60 L_{dn} (feet)	L_{dn} (dBA) 100 feet from Centerline
Interstate 80					
State Route 50 to County Road 32A	125,300	323	691	1,487	78.7
Mace Boulevard to Solano County Line	101,100	280	599	1,289	77.8
Interstate 5					
Sacramento County Line to County Road 102	68,500	216	463	996	76.3
State Route 113 to County Road 13	46,200	167	356	766	74.6
County Road 13 to Interstate 505	25,900	115	243	521	72.1
Interstate 505 to Colusa County Line	34,600	138	294	632	73.3
Interstate 505					
State Route 128 to State Route 16	18,900	94	197	423	70.7
State Route 16 to County Road 14	10,500	66	135	286	68.2
State Route 113					
Solano County Line to Covell Boulevard	48,800	173	369	794	74.8
Covell Boulevard to Gibson Road	44,500	163	347	747	74.4
Interstate 5 to County Road 17	12,600	73	151	323	68.9
County Road 17 to County Road 13	4,600	< 50	58	124	63.3
County Road 13 to Sutter County Line	7,100	< 50	77	166	65.2
State Route 16					
County Road 98 to County Road 94B	14,300	57	123	264	68.2
County Road 94B to Interstate 505	11,100	< 50	104	223	67.1
Interstate 505 to County Road 87	20,400	72	156	335	69.8
County Road 87 to County Road 78	19,100	69	149	320	69.5
State Route 128					
Interstate 505 to Winters	13,800	< 50	86	185	65.9
Winters to County Road 86	10,100	< 50	97	210	66.7
State Route 84					
Clarksburg Road to West Sacramento	4,300	< 50	55	119	63.0
West Sacramento to State Route 50	35,800	105	226	487	72.2
State Route 50 to Interstate 80	27,400	88	189	408	71.1
State Route 45					
State Route 113 to Country Road 98A	1,300	< 50	< 50	54	57.8

[a] Average Daily Traffic.
Source: LSA Associates, Inc., March 2009.

Table IV.E-13: Cumulative (2030) County Roadway Traffic Noise Levels With Build-Out of 1983 General Plan

Roadway Segment	ADT	Center-line to 70 L_{dn} (feet)	Center-line to 65 L_{dn} (feet)	Center-line to 60 L_{dn} (feet)	L_{dn} (dBA) 100 feet from Centerline
County Road 85 - State Route 16 to County Road 14	600	< 50	< 50	< 50	50.4
County Road 85 - County Road 14 to County Road 8	700	< 50	< 50	< 50	51.1
County Road 87 - State Route 16 to County Road 19	600	< 50	< 50	< 50	50.4
County Road 89 - County Road 29A to County Road 27	5,400	< 50	< 50	99	59.9
County Road 89 - County Road 27 to County Road 24A	5,400	< 50	< 50	99	59.9
County Road 89 - County Road 24A to State Route 16	2,100	< 50	< 50	53	55.8
County Road 94B - State Route 16 to County Road 19	800	< 50	< 50	< 50	51.6
County Road 98 - Solano County to County Road 31	4,900	< 50	< 50	93	59.5
County Road 98 - County Road 31 to County Road 29	6,700	< 50	53	114	60.9
County Road 98 - County Road 29 to County Road 27	7,300	< 50	56	121	61.2
County Road 98 - County Road 27 to County Road 24	6,900	< 50	54	116	61.0
County Road 98 - County Road 24 to State Route 16	8,500	< 50	62	134	61.9
County Road 98 - Main Street to Interstate 5	6,100	< 50	< 50	107	60.5
County Road 99 - County Road 31 to County Road 27	2,000	< 50	< 50	51	55.6
County Road 99 - County Road 27 to Gibson Road	2,700	< 50	< 50	63	56.9
County Road 101A - West Covell Boulevard to County Road 29	6,800	< 50	54	115	60.9
County Road 102 - East Covell Boulevard to County Road 29	11,100	< 50	74	160	63.1
County Road 102 - County Road 29 to County Road 27	13,900	< 50	86	186	64.0
County Road 102 - County Road 27 to Gibson Road	17,800	< 50	102	219	65.1
County Road 102 - Gibson Road to Interstate 5	29,300	66	142	305	67.3
County Road 102 - Interstate 5 to County Road 17	14,800	< 50	90	194	64.3
County Road 102 - County Road 17 to County Road 113	12,100	< 50	79	169	63.4
County Road 105 - County Road 32A to County Road 28H	3,000	< 50	< 50	67	57.4
Old River Road - County Road 127 to County Road 118	9,600	< 50	68	145	62.4
Russell Boulevard - Interstate 505 to County Road 31	7,000	< 50	55	118	61.1
County Road 31 - County Road 93A to County Road 95	7,100	< 50	55	119	61.1
County Road 31 - County Road 95 to County Road 98	7,700	< 50	58	125	61.5
County Road 29A - Interstate 505 to County Road 95	700	< 50	< 50	< 50	51.1
County Road 29 - County Road 95 to County Road 98	1,600	< 50	< 50	< 50	54.7
County Road 29 - State Route 113 to County Road 102	4,600	< 50	< 50	89	59.2
County Road 28H - County Road 102 to County Road 105	3,000	< 50	< 50	67	57.4
County Road 27 - Interstate 505 to County Road 95	3,400	< 50	< 50	73	57.9
County Road 27 - County Road 95 to County Road 98	3,800	< 50	< 50	78	58.4
County Road 27 - County Road 98 to State Route 113	6,600	< 50	53	113	60.8
County Road 24 - County Road 90 to County Road 95	1,400	< 50	< 50	< 50	54.1
County Road 24 - County Road 95 to County Road 98	4,700	< 50	< 50	90	59.3
County Road 23 - County Road 85B to County Road 89	3,400	< 50	< 50	73	57.9
County Road 19 - County Road 87 to Interstate 505	2,100	< 50	< 50	53	55.8
County Road 19 - Interstate 505 to County Road 94B	2,100	< 50	< 50	53	55.8
County Road 16A - Interstate 5 to State Route 113	1,100	< 50	< 50	< 50	53.0
County Road 17 - State Route 113 to County Road 102	1,200	< 50	< 50	< 50	53.4
County Road 14 - County Road 85 to Interstate 505	1,000	< 50	< 50	< 50	52.6
County Road 14 - Interstate 505 to Interstate 5	1,000	< 50	< 50	< 50	52.6
County Road 13 - Interstate 5 to State Route 113	3,000	< 50	< 50	67	57.4
County Road 12A - County Road 85 to Interstate 505	200	< 50	< 50	< 50	45.6
County Road 12A - Interstate 505 to County Road 99W	200	< 50	< 50	< 50	45.6

Source: LSA Associates, Inc., March 2009.

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Table IV.E-14: Cumulative (2030) Highway Traffic Noise Levels With Build-Out of Draft General Plan

Roadway Segment	ADT	Center-line to 70 L_{dn} (feet)	Center-line to 65 L_{dn} (feet)	Center-line to 60 L_{dn} (feet)	L_{dn} (dBA) 100 feet from Centerline	Increase in L_{dn} (dBA) over Cumulative No Project
Interstate 80						
State Route 50 to County Road 32A	127,000	325	698	1,501	78.8	0.1
Mace Boulevard to Solano County Line	102,300	282	604	1,299	77.8	0.0
Interstate 5						
Sacramento County Line to County Road 102	85,100	249	535	1,150	77.2	0.9
State Route 113 to County Road 13	59,600	197	422	907	75.7	1.1
County Road 13 to Interstate 505	45,600	165	353	759	74.5	2.4
Interstate 505 to Colusa County Line	71,500	222	476	1,024	76.5	3.2
Interstate 505						
State Route 128 to State Route 16	28,000	121	256	549	72.4	1.7
State Route 16 to County Road 14	26,400	116	246	528	72.2	4.0
State Route 113						
Solano County Line to Covell Boulevard	51,700	179	384	825	75.1	0.3
Covell Boulevard to Gibson Road	49,800	175	374	805	74.9	0.5
Interstate 5 to County Road 17	15,800	84	175	375	69.9	1.0
County Road 17 to County Road 13	5,200	< 50	63	135	63.9	0.6
County Road 13 to Sutter County Line	9,400	< 50	93	200	66.4	1.2
State Route 16						
County Road 98 to County Road 94B	16,400	63	135	290	68.8	0.6
County Road 94B to Interstate 505	13,900	56	121	259	68.1	1.0
Interstate 505 to County Road 87	23,000	78	168	363	70.3	0.5
County Road 87 to County Road 78	20,000	71	154	330	69.7	0.2
State Route 128						
Interstate 505 to Winters	12,500	< 50	80	173	65.5	-0.4
Winters to County Road 86	9,300	< 50	92	198	66.4	-0.3
State Route 84						
Clarksburg Road to West Sacramento	4,500	< 50	57	122	63.2	0.2
West Sacramento to State Route 50	35,400	104	225	484	72.2	0.0
State Route 50 to Interstate 80	28,400	90	194	417	71.2	0.1
State Route 45						
State Route 113 to Country Road 98A	1,300	< 50	< 50	54	57.8	0.0

Source: LSA Associates, Inc., March 2009.

Table IV.E-15: Cumulative (2030) County Roadway Traffic Noise Levels With Build-Out of Draft General Plan

Roadway Segment	ADT	Center-line to 70 L_{dn} (feet)	Center-line to 65 L_{dn} (feet)	Center-line to 60 L_{dn} (feet)	L_{dn} (dBA) 100 feet from Centerline	Increase in L_{dn} (dBA) over Cumulative No Project
County Road 85 - State Route 16 to County Road 14	2,000	< 50	< 50	51	55.6	5.2
County Road 85 - County Road 14 to County Road 8	1,000	< 50	< 50	< 50	52.6	1.5
County Road 87 - State Route 16 to County Road 19	600	< 50	< 50	< 50	50.4	0.0
County Road 89 - County Road 29A to County Road 27	10,300	< 50	71	152	62.7	2.8
County Road 89 - County Road 27 to County Road 24A	14,300	< 50	88	189	64.2	4.3
County Road 89 - County Road 24A to State Route 16	16,300	< 50	96	206	64.7	8.9
County Road 94B - State Route 16 to County Road 19	1,200	< 50	< 50	< 50	53.4	1.8
County Road 98 - Solano County to County Road 31	4,700	< 50	< 50	90	59.3	-0.2
County Road 98 - County Road 31 to County Road 29	7,000	< 50	55	118	61.1	0.2
County Road 98 - County Road 29 to County Road 27	8,000	< 50	60	128	61.6	0.4
County Road 98 - County Road 27 to County Road 24	7,900	< 50	59	127	61.6	0.6
County Road 98 - County Road 24 to State Route 16	9,200	< 50	66	141	62.3	0.4
County Road 98 - Main Street to Interstate 5	9,300	< 50	66	142	62.3	1.8
County Road 99 - County Road 31 to County Road 27	2,100	< 50	< 50	53	55.8	0.2
County Road 99 - County Road 27 to Gibson Road	2,700	< 50	< 50	63	56.9	0.0
County Road 101A - West Covell Boulevard to County Road 29	7,200	< 50	56	120	61.2	0.3
County Road 102 - East Covell Boulevard to County Road 29	11,400	< 50	76	163	63.2	0.1
County Road 102 - County Road 29 to County Road 27	14,900	< 50	90	194	64.3	0.3
County Road 102 - County Road 27 to Gibson Road	18,000	< 50	102	220	65.2	0.1
County Road 102 - Gibson Road to Interstate 5	28,900	65	140	302	67.2	-0.1
County Road 102 - Interstate 5 to County Road 17	17,600	< 50	101	217	65.1	0.8
County Road 102 - County Road 17 to County Road 113	12,900	< 50	82	177	63.7	0.3
County Road 105 - County Road 32A to County Road 28H	4,900	< 50	< 50	93	59.5	2.1
Old River Road - County Road 127 to County Road 118	15,200	< 50	92	197	64.4	2.0
Russell Boulevard - Interstate 505 to County Road 31	6,700	< 50	53	114	60.9	-0.2
County Road 31 - County Road 93A to County Road 95	7,300	< 50	56	121	61.2	0.1
County Road 31 - County Road 95 to County Road 98	8,200	< 50	61	131	61.8	0.3
County Road 29A - Interstate 505 to County Road 95	700	< 50	< 50	< 50	51.1	0.0
County Road 29 - County Road 95 to County Road 98	2,600	< 50	< 50	61	56.8	2.1
County Road 29 - State Route 113 to County Road 102	5,700	< 50	< 50	103	60.2	1.0
County Road 28H - County Road 102 to County Road 105	4,900	< 50	< 50	93	59.5	2.1
County Road 27 - Interstate 505 to County Road 95	3,900	< 50	< 50	80	58.5	0.6
County Road 27 - County Road 95 to County Road 98	3,500	< 50	< 50	74	58.1	-0.3
County Road 27 - County Road 98 to State Route 113	7,300	< 50	56	121	61.2	0.4
County Road 24 - County Road 90 to County Road 95	6,700	< 50	53	114	60.9	6.8
County Road 24 - County Road 95 to County Road 98	7,500	< 50	57	123	61.4	2.1
County Road 23 - County Road 85B to County Road 89	4,400	< 50	< 50	86	59.0	1.1
County Road 19 - County Road 87 to Interstate 505	4,400	< 50	< 50	86	59.0	3.2
County Road 19 - Interstate 505 to County Road 94B	2,500	< 50	< 50	59	56.6	0.8
County Road 16A - Interstate 5 to State Route 113	2,200	< 50	< 50	55	56.0	3.0
County Road 17 - State Route 113 to County Road 102	1,200	< 50	< 50	< 50	53.4	0.0
County Road 14 - County Road 85 to Interstate 505	2,300	< 50	< 50	56	56.2	3.6
County Road 14 - Interstate 505 to Interstate 5	1,700	< 50	< 50	< 50	54.9	2.3
County Road 13 - Interstate 5 to State Route 113	2,400	< 50	< 50	58	56.4	-1.0
County Road 12A - County Road 85 to Interstate 505	200	< 50	< 50	< 50	45.6	0.0
County Road 12A - Interstate 505 to County Road 99W	200	< 50	< 50	< 50	45.6	0.0

Source: LSA Associates, Inc., March 2009.

However, even with implementation of these policies and actions, increases in traffic noise from build-out of the proposed Draft General Plan could result in significant and unavoidable impacts on existing sensitive land uses adjacent to impacted roadway segments throughout the County.

Mitigation Measure NOI-1: None available.

While implementation of the policies and actions included in the Draft General Plan would reduce the severity of this impact, no feasible mitigation measure was identified to reduce this impact to a less-than-significant level. This impact would remain significant and unavoidable. (SU)

Impact NOI-2: Build-out of the proposed Draft General Plan would result in traffic noise levels in excess of the County's normally acceptable standard of 60 dBA L_{dn} for new noise sensitive land use development. (S)

Based on the County's noise compatibility guidelines and Policies HS-7.1, HS-7.3, and HS-7.4 of the Draft General Plan, new proposed noise sensitive land use development, such as residential development projects, in areas that would experience traffic noise levels in excess of 60 dBA L_{dn} would be required to incorporate all reasonable and feasible noise reduction features into the design of the project to reduce traffic noise impacts. According to Actions HS-A63, HS-A65, and HS-A73, any future development projects along impacted roadway segments throughout the County would require additional environmental analysis to determine the measures necessary to reduce traffic-related noise impacts to a less-than-significant level.

Implementation of the following mitigation measure would reduce traffic noise impacts on future proposed noise sensitive land use development along impacted roadway segments within the County to a less-than-significant level:

Mitigation Measure NOI-2: The Draft General Plan shall be amended to include the following new policy in the Health and Safety Element.

Policy HS-#: All proposed new development of noise sensitive land uses in areas that would experience traffic noise levels in excess of 60 dBA L_{dn} shall submit an acoustical analysis prior to issuance of building permits demonstrating how all reasonable and feasible noise insulation features have been incorporated into the project design that would reduce traffic noise impacts to meet the County's interior noise level standard for such land uses. (LTS)

(2) Exposure to Vibration Impacts. The following section evaluates potential vibration impacts related to railroad noise, stationary noise sources, mining, farming and construction.

Railroad Noise. Train operations in Yolo County are not assumed to increase during the planning horizon covered by the Draft General Plan. However, in the event that train traffic does increase, noise associated with trains is unlikely to significantly change from existing noise conditions. The calculated existing railroad noise levels, detailed in the existing noise environment section, evaluated a conservative scenario that assumed a "worst case" railroad operations scenario. The analysis assumed the maximum estimated number of locomotives, rail cars, and train-passings

per day for each of the railroad operators. Future railroad noise levels are not expected to increase over the calculated existing train-related noise levels. Also, the Draft General Plan does not include any proposed policies or actions that would result in any increase in railroad activity throughout the County. Therefore, implementation of the Draft General Plan would not result in any permanent increase in ambient noise levels from railroad noise sources.

Additionally, the Draft General Plan does not include any proposed development, policies, or actions that would result in an increased exposure of people residing or working in an area of the County to excessive railroad noise levels. It is the County's policy, as stated in Policy HS-7.5, to minimize the impact of noise from transportation sources, including rail lines, on nearby sensitive land uses. The County also supports improvements to at-grade crossings to eliminate the need for train warning horns in, near, or through communities, as stated in Policy HS-7.6. According to Policy HS-7.7, the County also encourages railroad companies to adopt operational strategies that reduce the potential for noise and interrupted traffic flow. It is also the County's policy, as shown in Policy HS-7.1, to ensure that existing and planned noise sensitive land uses are compatible with the current and projected noise environment. The County's Policies HS-7.3, and HS-7.4 protect important agricultural, commercial, industrial, and transportation uses from encroachment by noise sensitive land use development; where any noise sensitive land use development is proposed in existing impacted areas, greater exterior noise levels may be allowed provided all available reasonable and feasible exterior noise level reduction measures have been implemented. Actions HS-A63 and HS-A65 address applicable land use compatibility standards and required noise analysis/acoustical studies for proposed development of noise sensitive land uses in noise-impacted environments. Actions HS-A70 and HS-A73 also seek to minimize noise conflicts between transportation networks and sensitive land use development. Therefore, implementation of the Draft General Plan is anticipated to generally result in less-than-significant noise impacts from railroad noise sources.

In extreme cases, excessive groundborne vibration from trains has the potential to cause structural damage to buildings. The Draft General Plan does not include any proposed development, policies, or actions that would result in an increased exposure of people residing or working in an area of the County to excessive groundborne vibration levels from railroad sources. Implementation of the Draft General Plan Policies HS-7.1, HS-7.3, and HS-7.4, would restrict noise sensitive land use development in areas already impacted by existing railroad groundborne vibration levels. Therefore, implementation of the Draft General Plan would not result in exposure of persons to or generate excessive vibration from railroad sources.

(3) Exposure to Aircraft Noise Impacts. While future individual airport projects may be proposed and implemented during the current planning horizon, the Draft General Plan does not include any proposed policies or actions that would result in any direct increase in aircraft traffic volumes or changes in existing aircraft patterns throughout the County. In addition, any proposed individual proposed airport expansion project would be required to meet its own environmental review. Therefore, implementation of the Draft General Plan would not result in any permanent increase in ambient noise levels from airport operational noise sources.

The Draft General Plan supports greater agricultural intensification which could lead to increases in aerial applications as a support industry. Noise associated with aerial applications is considered acceptable in agricultural areas and excessive aircraft noise levels are not anticipated.

It is the County's policy, as stated in Policy HS-7.5, to minimize the impact of noise from transportation sources, including airport operational noise sources, on nearby sensitive land uses. Action HS-A67 of the Draft General Plan limits land uses within airport safety zones to those that are consistent with airport Comprehensive Land Use Plans; Action HS-A68 requires that all proposed development projects within areas requiring airport land use compatibility be sent for review by the Airport Land Use Commission. Therefore, implementation of the Draft General Plan would result in less-than-significant noise impacts from aircraft noise sources.

(4) Exposure to Stationary Noise Impacts and Resulting Increases in Ambient Noise. Implementation of the Draft General Plan would result in stationary noise and vibration impacts from mining operations, farming operations, and construction.

Mining Noise. The sand and gravel mining activities described in the existing noise environment section are expected to continue through 2027 under the existing off-channel mining permits approved for a 30-year period in 1997. Therefore, mining-related noise levels are not expected to change from existing levels during the planning horizon of the Draft General Plan. Prior to the completion of the 30-year period, the County is likely to consider the extension of off-channel mining into new aggregate reserves along Cache Creek. If the permits are extended, they will be subject to the goals, policies and actions of the Draft General Plan, to the noise regulations of the OCMP, and to all applicable ordinances of the County Code. Any proposed individual mining expansion project would be required to undertake its own environmental review. Implementation of Draft General Plan policies and actions, in conjunction with compliance with existing regulatory programs, would ensure that mining noise impacts would be less than significant.

Agricultural Noise. Farming activities on agricultural land in Yolo County are strongly promoted in the Draft General Plan and are therefore expected to expand. With the proposed build-out under the Draft General Plan, increases in intensity of agricultural activity and/or changes in crops or operations are expected. The sum total of this expected increase in all types of agricultural activity would have to result in an approximate doubling of existing noise sources for there to be a perceptible resulting increase in ambient noise levels above existing conditions. For example, twice the number of pieces of farming equipment operating at the same time on agricultural land would be necessary to produce a perceivable increase in ambient noise levels. This level of activity increase is not anticipated to occur. Therefore, build-out of the Draft General Plan is not expected to result in any permanent increase in ambient noise levels from farming noise sources.

However, stationery agricultural-industrial and agricultural-commercial uses (e.g., grain operations, feed stores, wineries) are also expected to increase with implementation of the Draft General Plan by approximately 854 acres over the existing 320 acres of such uses currently operating within the County. Expansion of existing facilities and development of new sites could result in permanent increases in ambient noise levels in the vicinity of such projects. Action HS-A64 of the Draft General Plan requires the preparation of a noise analysis, including recommendations for attenuation, be submitted to the Planning and Public Works Department for all proposed projects which may result in potentially significant noise impacts to nearby sensitive receptors.

In addition, Policy HS-7.3 of the Draft General Plan protects important agricultural uses from encroachment by land uses that are sensitive to noise impacts. Actions HS-A62, HS-A63, HS-A66, and HS-A69 of the Draft General Plan are designed to protect new proposed noise sensitive land use

development from existing stationary noise impacts. According to Action HS-A62, the Planning and Public Works Department will regulate the location and operation of land uses to avoid or mitigate harmful or nuisance levels of noise to noise sensitive land uses. According to Actions HS-A63 and Action HS-A66, new discretionary land use development shall be reviewed for consistency with the Noise Compatibility Guidelines; and, where any exceedance occurs, such proposed development would be required to submit a noise analysis with recommended measures for reducing noise impacts to meet interior noise level standards. Action HS-A69 requires the Planning and Public Works Department to designate appropriate zoning that avoids placing significant new noise sensitive land uses in proximity of existing or planned commercial and industrial uses.

Implementation of these Draft General Plan policies and actions, in conjunction with compliance with existing regulatory programs, will help mitigate noise impacts from farming, agricultural-industrial, and agricultural-commercial activities;however the potential remains for agricultural noise to be perceived as significant.

Construction Noise. New commercial, industrial and residential construction will be focused in Dunnigan, Esparto, Knights Landing, Madison, Elkhorn and around highway interchanges, with more limited development in Monument Hills, Yolo and Zamora. In each of these locations, proposed individual development projects would be required under environmental review to comply with all applicable noise-related ordinances of the County Code and the policies and actions of the Draft General Plan.

It is expected that maximum noise levels from construction activities due to build-out under the Draft General Plan would result in a substantial periodic increase in ambient noise levels. Action HS-A61 of the Draft General Plan requires the County to adopt a comprehensive Noise Ordinance that specifically addresses construction noise. However, even with such a noise ordinance, in order for build-out under the Draft General Plan to occur, construction noise will occur, resulting in impacts on nearby sensitive receptors. Restricting the permissible hours of construction would reduce construction noise impacts on nearby sensitive receptors; however, there are not any reasonable or feasible mitigation measures available that would reduce this impact to a less-than-significant level. Therefore, project-related construction noise impacts on sensitive receptors throughout the County would remain significant and unavoidable.

Urban Noise. Generally noise levels tend to be greater in more "urban" environments. Pursuant to Action HS-A63, the Noise Compatibility Guidelines may not be used to prohibit or preclude the planned development based solely on the issue of noise generation. The County has indicated that this recognizes that developed areas tend to have higher ambient noise levels as land uses become more dense and/or intense. The action reflects the County's commitment to increased density and more compact urban form.

<u>Impact NOI-3</u>: Build-out of the proposed Draft General Plan would result in a substantial or periodic increase in ambient noise levels. (S)

<u>Mitigation Measure NOI-3</u>: None available.

While implementation of the policies and actions included in the Draft General Plan would reduce the severity of this impact, no feasible mitigation measure was identified to reduce this

impact to a less-than-significant level. This impact would remain significant and unavoidable. (SU)

Impact NOI-4: Build-out of the proposed Draft General Plan would result in excessive groundborne vibration levels from construction activities. (S)

In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. Common sources of groundborne vibration include trains and construction activities such as blasting, pile driving and operating heavy earthmoving equipment. It is anticipated that certain construction activities associated with development under the Draft General Plan could expose noise sensitive receptors to excessive groundborne vibration levels, due to the construction of projects that would require pile driving. Pile driving can generate groundborne vibration that can be perceptible at a distance of 100 feet, but would not generally be expected to cause damage to other properties. The potential exception would be buildings that are fragile and extremely susceptible to vibration damage. As shown in Table IV.E-3, typical groundborne vibration levels measured at a distance of 25 feet from impact pile drivers range up to approximately 112 VdB. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure NOI-4: Amend Action HS-A61 of the Draft General Plan as follows:

Action HS-A61: Adopt a comprehensive Noise Ordinance that includes the following components:

- Standards to implement "quiet" pile driving technology (such as pre-drilling of piles, the use of auger cast piles, or similar technology) where feasible in consideration of geotechnical and structural requirements and conditions. (LTS)

(5) Conflicts with Other Plans. The policies and actions contained in the Draft General Plan would implement the State, federal and existing plans related to the environment. Therefore, the Draft General Plan would not conflict with these plans.

(6) Result in Adverse Impacts from Draft General Plan Policies Compared to 1983 General Plan Policies. Implementation of the Draft General Plan would result in new policies compared to the 1983 General Plan policies. A review of the 1983 General Plan policies related to noise determined that those policies are either equivalent to or less rigorous than those proposed under the Draft General Plan. In general, the Draft General Plan would provide more stringent environmental protection and greater accountability in the regulation of development activities that would be affected by noise. Therefore, implementation of the Draft General Plan in place of the prior 1983 General Plan would not result in a significant adverse physical impact related to noise as compared to the 1983 General Plan.