3.10 Noise

This chapter evaluates the potential effect of the proposed General Plan update on the noise environment within the Planning Area.

Environmental Setting

PHYSICAL SETTING

Noise Fundamentals

Sound and Noise

Sound is a process that consists of three components: the sound source, the sound path and the sound receiver. All three components must be present for sound to exist. Without a source to produce sound or a medium to transmit sound-pressure waves, there is no sound. Sound also must be received; a hearing organ, sensor, or object must be present to perceive, register or be affected by sound or noise. In most situations, there are many different sound sources, paths and receivers, not only one of each. Noise is defined as loud, unpleasant, unexpected, or undesired sound.

Sound Pressure Levels and Decibels

The amplitude of a sound determines its loudness. Loudness of sound increases and decreases with increasing and decreasing amplitude. Sound pressure level (SPL) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called bels, named after Alexander Graham Bell. To provide finer resolution, a bel is divided into 10 decibels (dB).

Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted by ordinary arithmetic means. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. When two sounds of equal SPL are combined, they produce a combined SPL 3 dB greater than the original individual SPL. In other words, sound energy must be doubled to produce a 3 dB increase. If two sound levels differ by 10 dB or more, the combined SPL is equal to the higher SPL; the lower sound level would not increase the higher sound level.

A-Weighted Decibels

SPL alone is not a reliable indicator of loudness. The frequency of a sound also has a substantial effect on how humans respond. Although the intensity of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. To approximate the frequency response of the human ear, a series of SPL adjustments is usually applied to the sound measured by a sound level meter. The adjustments, referred to as a weighting network, are frequency-dependent.

The A-scale weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. Noise levels for environmental noise studies are typically reported in terms of A-weighted decibels (dBA). In environmental noise studies, A-weighted SPLs are commonly referred to as noise levels. **Table 3.10-1** shows typical A-weighted noise levels.

Table 3.10-1: Typical Noise Levels

Common Outdoor Activities	*Noise Level (dBA)*	*Common Indoor Activities*
	— 110 —	Rock band
Jet flyover at 300 meters (1,000 feet)		
	— 100 —	
Gas lawn mower at 1 meter (3 feet)		
	— 90 —	
Diesel truck at 15 meters (50 feet) at 80 kilometers per hour (50 miles per hour)		Food blender at 1 meter (3 feet)
	— 80 —	Garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime		
Gas lawn mower, 30 meters (100 feet)	— 70 —	Vacuum cleaner at 3 meters (10 feet)
Commercial area		Normal speech at 1 meter (3 feet)
Heavy traffic at 90 meters (300 feet)	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio

Table 3.10-1: Typical Noise Levels

Common Outdoor Activities	*Noise Level (dBA)*	*Common Indoor Activities*
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans, 1998

Human Response to Changes in Noise Levels

It is widely accepted that the average healthy ear can barely perceive 3-dB noise level changes. A 5-dB change is readily perceptible, and a 10-dB change is perceived as being twice or half as loud. As discussed above, doubling sound energy results in a 3-dB increase in sound; therefore, doubling sound energy (e.g., doubling the volume of traffic on a highway) would result in a barely perceptible change in sound level.

Noise Descriptors

Noise in our daily environment fluctuates over time. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in traffic noise analysis.

- **Equivalent sound level (L_{eq}):** L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level that in a stated period would contain the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level (L_{eq}[h]) is the energy average of the A-weighted sound levels occurring during a 1-hour period.
- **Percentile-exceeded sound level (L_x)**: L_x represents the sound level exceeded for a given percentage of a specified period (e.g., L_{10} is the sound level exceeded 10 percent of the time, L_{90} is the sound level exceeded 90 percent of the time).
- **Maximum sound level (L_{max})**: L_{max} is the highest instantaneous sound level measured during a specified period.
- **Day-night level (L_{dn})**: L_{dn} is the energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring between 10 p.m. and 7 a.m.
- **Community noise equivalent level (CNEL)**: CNEL is the energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring between 10 p.m. and 7 a.m. and 5 dB added to the A-weighted sound levels occurring between 7 p.m. and 10 p.m.

Sound Propagation and Attenuation

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

- **Geometric Spreading:** Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (or drops off) at a rate of 6 dBA for each doubling of distance. Highway noise is unique in that the movement of vehicles makes the source of the sound appear to emanate from a line (i.e., a line source) rather than a point. The drop off rate for line sources is 3 dB per doubling of distance.
- **Ground Absorption:** The noise path between the highway and the observer is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. For acoustically hard sites (i.e., those sites with a reflective surface, such as a parking lot or a smooth body of water, between the source and the receiver), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees, between the source and the receiver), an excess ground-attenuation value of 1.5 dBA per doubling of distance is normally assumed. When added to the geometric spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dBA per doubling of distance for a line source and 7.5 dBA per doubling of distance for a point source.
- **Atmospheric Effects:** Atmospheric conditions can have a significant effect on noise propagation. Wind has been shown to be the most important meteorological factor within about 500 feet of the source, whereas vertical air-temperature gradients are more important for greater distances. Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lower noise levels. Increased sound levels can also occur as a result of temperature inversion conditions (i.e., increasing temperature with elevation).
- **Shielding by Natural or Human-Made Features:** A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by this shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dB of noise reduction. A taller barrier may provide as much as 20 dB of noise reduction.

Effects of Noise

The effects of noise on humans may include annoyance, interference with various activities, hearing loss, and stress-related health problems. These effects of noise are discussed below.

- **Annoyance** is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capability (for instance, some people like the sound of trains, while others do not).
- **Speech interference** is one of the primary concerns associated with environmental noise. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range

or louder may interfere with speech. Depending upon the distance between the talker and the listener, background noise levels may require a raised voice in order to communicate. Transportation sources can easily interfere with conversation within a few hundred feet of the source.

- **Sleep interference** is a major noise concern related to traffic-generated noise. Sleep disturbance studies have identified interior noise levels attributed to traffic noise as a key factor of sleep disturbance. However, it should be noted that sleep disturbance does not necessarily mean awakening from sleep, but can refer to altering the pattern and stages of sleep. Train noise (especially horn soundings) is a major source of complaints.
- **Potential hearing loss** is commonly associated with occupational exposures in heavy industry or very noisy work environments. Noise levels in neighborhoods, even near very noisy airports, are not sufficiently loud to cause hearing loss.
- **Physiological responses** are those measurable noise effects on the human metabolism. They are ascertained as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent to which these physiological responses cause harm or are a sign of harm is not known.

Vibration

Operation of heavy construction equipment, particularly pile driving and other impacts devices such as pavement breakers create seismic waves that radiate along the surface of the earth and downward into the earth. These surface waves can be felt as ground vibration. Vibration from operation of this equipment can result in effects ranging from annoyance of people to damage of structures. Varying geology and distance will result in different vibration levels containing different frequencies and displacements. In all cases, vibration amplitudes will decrease with increasing distance.

Perceptible ground-borne vibration is generally limited to areas within a few hundred feet of construction activities. As seismic waves travel outward from a vibration source, they excite the particles of rock and soil through which they pass and cause them to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in inches per second) at which these particles move is the commonly accepted descriptor of the vibration amplitude, referred to as the peak particle velocity (PPV).

Table 3.10-2 summarizes typical vibration levels generated by construction equipment (FTA 2006).

Table 3.10-2: Vibration Source Levels for Construction Equipment

Equipment	*PPV at 25 feet*
Pile driver (impact)	0.644 to 1.518
Pile drive (sonic/vibratory)	0.170 to 0.734
Vibratory roller	0.210
Hoe ram	0.089
Large bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003

Source: FTA 2006.

Vibration amplitude attenuates over distance and is a complex function of how energy is imparted into the ground and the soil conditions through which the vibration is traveling. The following equation can be used to estimate the vibration level at a given distance for typical soil conditions (FTA 2006). PPV_{ref} is the reference PPV from **Table 3.10-2**:

$PPV = PPV_{ref} \text{ x } (25/\text{Distance})^{1.5}$

Table 3.10-3 summarizes damage thresholds recommended by Caltrans (Caltrans 2004) for transient and continuous construction vibration. Equipment or activities typical of continuous vibration include: excavation equipment, static compaction equipment, tracked vehicles, traffic on a highway, vibratory pile drivers, pile-extraction equipment, and vibratory compaction equipment. Equipment or activities typical of single-impact (transient) or low-rate repeated impact vibration include: impact pile drivers, blasting, drop balls, “pogo stick” compactors, and crack-and-seat equipment (Caltrans, 2004).

Table 3.10-3: Guideline Vibration Damage Potential Threshold Criteria

	Maximum PPV (in/sec)	
Structure and Condition	*Transient Sources*	*Continuous/Frequent Intermittent Sources*
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans, 2004

Similar criteria relating to human perception have also been developed by Caltrans (Caltrans 2004) and are summarized in **Table 3.10-4**.

Table 3.10-4: Guideline Vibration Annoyance Potential Criteria

	Maximum PPV (in/sec)	
Structure and Condition	*Transient Sources*	*Continuous/Frequent Intermittent Sources*
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.1
Severe	2.0	0.4

Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans, 2004

Noise Sensitive Land Uses

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Places where people live, sleep, recreate, worship and study generally are considered to be sensitive to noise because intrusive noise can be disruptive to these activities.

Low, medium, and high density residential uses are scattered throughout the city. Residential uses also are located near the SR 99/Highway 198 corridor, but are mainly concentrated east of Shirk Street along Highway 198 (north of W. Visalia Parkway and south of Pratt Avenue), which generally coincides with the existing urban footprint. Schools, public parks and recreation areas, libraries, hospitals, and churches/places of worship are located throughout the city.

Noise Sources

Sources of noise in Visalia include both mobile and stationary noise sources.

Highways and Roadways

Traffic travelling on roadways is the primary source of noise in the City. State highways in the City include SR99, SR63, SR198, and SR216. Other major roadways include Shirk Road, Akers Street, Demaree Street, Caldwell Avenue, and Goshen Avenue.

Traffic noise is a function of volume, speed, and type of vehicles. The number of trucks in the vehicle mix is important because trucks generate higher noise than automobiles. The FHWA Traffic Noise Model (TNM) version 2.5 was used to develop L_{dn} contours for major roadways in the City. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions. Estimates of the hourly distribution of traffic for a typical 24-hour period were used to develop L_{dn} values from L_{eq} values. Traffic data representing annual average traffic volumes and truck mix, for existing conditions, were obtained from the project traffic engineers (Omni Means, 2010). Using these data and the FHWA methodology, traffic noise levels expressed in L_{dn}, were calculated for existing traffic volumes.

The modeled traffic noise level at 50 feet from the roadway centerline and distances from the centerlines of selected roadways to the 60 dB, 65 dB, and 70dB Ldn contours are summarized in **Table 3.10-5**. In many cases, the actual distances to noise level contours may vary from the distances predicted by the FHWA model. Factors such as roadway curvature, roadway grade, shielding from local topography or structures, elevated roadways, or elevated receivers may affect actual sound propagation. The distances reported are considered to be conservative estimates of noise exposure along roadways in the city.

Table 3.10-5: 2010 Traffic Data and Noise Levels

Roadway	*Segment Location*	*Existing Average Daily Traffic Volume**	*Speed*	*Truck %*	*L_{dn} at 50 Feet from Roadway Centerline*	*Distance to Contour (feet)*		
						70 L_{dn}	*65 L_{dn}*	*60L_{dn}*
North/South Roads								
SR99	South of Avenue 272	56,560	70	25	84	274	491	797
	Avenue 272 to Caldwell Avenue	56,760	70	25	84	275	492	798
	Caldwell Avenue to SR 198	60,080	70	25	84	284	504	816
	SR 198 to Riggin Avenue	62,180	70	25	84	289	512	827
	North of Riggin Avenue	58,000	70	25	84	278	497	805
Plaza Drive	Walnut Avenue to SR 198	4,370	35	2	59	<30	<30	46
	SR 198 to Goshen	21,510	40	8	70	49	91	171

Table 3.10-5: 2010 Traffic Data and Noise Levels

Roadway	*Segment Location*	*Existing Average Daily Traffic Volume**	*Speed*	*Truck %*	*L_{dn} at 50 Feet from Roadway Centerline*	*Distance to Contour (feet)*		
						70 L_{dn}	*65 L_{dn}*	*60L_{dn}*
	Avenue							
	Goshen Avenue to Riggin Road	13,820	40	8	68	35	72	132
	North of Riggin Road	9,630	40	4	65	<30	51	92
Shirk Road	Avenue 272 to Caldwell Avenue	1,320	55	2	60	<30	<30	49
	Caldwell Avenue to Whitendale	6,200	55	2	66	<30	60	101
	Whitendale to Walnut	6,430	55	3	67	<30	63	107
	Walnut to SR198	5,850	55	5	67	<30	64	111
	SR198 to Goshen Avenue	12,420	55	5	70	52	92	159
	Goshen Avenue to Riggin Road	8,550	55	5	69	41	77	132
	north of Riggin Road	100	55	5	51	<30	<30	<30
Akers Street	south of Avenue 272	9,990	55	3	69	42	78	131
	Avenue 272 to Caldwell Avenue	10,890	45	3	67	<30	61	106
	Caldwell Avenue to Whitendale Avenue	14,890	45	5	69	40	78	136
	Whitendale Avenue to Walnut Avenue	19,330	45	5	70	48	88	157
	Walnut Avenue to SR198	29,100	45	5	72	61	107	194
	SR198 to Goshen Avenue	33,070	45	5	72	64	114	208
	Goshen Avenue to Riggin Road	20,420	45	5	70	50	90	161
	north of Riggin Road	5,920	55	2	66	<30	58	98
Demaree Street	south of Avenue 272	12,050	55	2	69	45	82	136
	Avenue 272 to Caldwell Avenue	12,540	45	4	68	33	68	120
	Caldwell Avenue to Whitendale Avenue	18,330	45	3	69	42	80	136
	Whitendale Avenue to Walnut Avenue	21,580	40	3	68	38	74	129

Table 3.10-5: 2010 Traffic Data and Noise Levels

Roadway	*Segment Location*	*Existing Average Daily Traffic Volume**	*Speed*	*Truck %*	*L_{dn} at 50 Feet from Roadway Centerline*	*Distance to Contour (feet)*		
						70 L_{dn}	*65 L_{dn}*	*60L_{dn}*
	Walnut Avenue to State Route 198	20,140	40	5	69	40	79	141
	SR198 to Goshen Avenue	24,580	35	5	68	37	75	138
	Goshen Avenue to Houston Avenue	26,560	45	3	70	53	93	164
	Houston Avenue to Riggin Avenue	20,220	55	3	72	62	106	183
	North of Riggin Road	6,280	55	2	66	<30	60	101
Mooney Road (SR 63)	South of Avenue 272	11,190	45	8	68	37	75	134
	Avenue 272 to Caldwell Avenue	32,970	35	8	71	54	99	196
	Caldwell Avenue to Whitendale Avenue	31,700	35	8	70	52	97	192
	Whitendale Avenue to Walnut Avenue	25,560	35	8	69	46	88	169
	Walnut Avenue to Tulare Avenue	29,140	35	8	70	50	94	183
	Tulare Avenue to SR198	30,400	35	10	71	55	104	208
	SR198 to Main Street	31,880	35	10	71	57	107	214
Court Street	Avenue 272 to Caldwell Avenue	14,610	45	2	68	33	68	116
	Caldwell Avenue to Whitendale Avenue	10,630	45	3	67	<30	61	104
	Whitendale Avenue to Walnut Avenue	14,490	45	3	68	35	71	122
	Walnut Avenue to Tulare Avenue	14,610	35	4	66	<30	54	97
	Tulare Avenue to SR198	7,250	35	8	64	<30	43	83
Ben Maddox Way	Avenue 272 to Caldwell Avenue	NA	45	2	NA	<30	<30	<30
	Caldwell Avenue to Walnut Avenue	7,700	45	4	65	<30	53	94
	Walnut Avenue to Tulare	12,940	40	5	67	<30	62	112

Table 3.10-5: 2010 Traffic Data and Noise Levels

Roadway	*Segment Location*	*Existing Average Daily Traffic Volume**	*Speed*	*Truck %*	*L_{dn} at 50 Feet from Roadway Centerline*	*Distance to Contour (feet)*		
						70 L_{dn}	*65 L_{dn}*	*60L_{dn}*
	Avenue							
	Tulare Avenue to SR198	15,440	40	8	68	39	77	141
	SR198 to Goshen Avenue	16,760	45	8	70	50	91	167
	Goshen Avenue to SR 216	13,790	45	3	68	34	69	119
	SR 216 to Riggin Road	6,450	45	2	64	<30	43	80
	north of Riggin Road	5,330	45	2	63	<30	38	73
Lovers Lane	south of Avenue 272	11,390	55	4	70	47	86	146
	Avenue 272 to Caldwell Avenue	10,940	55	5	70	48	87	150
	Caldewell Avenue to Walnut Avenue	20,440	45	5	70	50	90	161
	Walnut Avenue to Tulare Avenue	19,870	45	5	70	49	89	159
	Tulare Avenue to SR198	23,120	45	6	71	56	98	182
	SR198 to Goshen Avenue	24,150	45	6	71	57	100	186
	Goshen Avenue to SR 216	19,340	45	4	69	46	85	149
	SR 216 to Riggin Road	5,610	50	2	65	<30	48	86
Road 148	Avenue 272 to Caldwell Avenue	2,580	55	2	63	<30	35	69
	Caldewell Avenue to Walnut Avenue	2,310	55	2	62	<30	0	65
	Walnut Avenue to SR198	3,620	55	2	64	<30	44	81
	SR198 to SR216	N/A	55	2	NA	NA	NA	NA
East/West Roads								
Avenue 272	SR99 to Shirk Street	1,570	55	2	61	<30	<30	54
	Shirk Street to Akers Road	2,840	55	2	63	<30	37	72
	Akers Road to Demaree Street	4,920	55	2	65	<30	53	92
	Demaree Street to SR63	13,040	55	2	70	48	85	142
	SR 63 to Court Street	7,940	55	2	68	33	67	113

Table 3.10-5: 2010 Traffic Data and Noise Levels

Roadway	*Segment Location*	*Existing Average Daily Traffic Volume**	*Speed*	*Truck %*	*L_{dn} at 50 Feet from Roadway Centerline*	*Distance to Contour (feet)*		
						70 L_{dn}	*65 L_{dn}*	*60L_{dn}*
Caldwell Avenue	Court Street to Bridge Street	8,370	55	2	68	35	69	116
	Bridge Street to Lovers Lane	5,210	55	2	66	<30	55	94
	Lovers Lane to Road 148	5,680	55	2	66	<30	57	97
	SR99 to Shirk Street	8,440	55	5	69	40	77	131
	Shirk Street to Akers Road	10,050	55	5	69	46	84	144
	Akers Road to Demaree Street	17,480	45	5	69	45	84	149
	Demaree Street to SR63	24,260	45	5	71	55	97	177
	SR 63 to Court Street	28,200	45	5	71	60	105	191
	Court to Ben Maddox Way	22,410	45	5	70	53	94	169
	Ben Maddox Way to Lovers Lane	13,420	45	5	68	37	74	129
	Lovers Lane to Road 148	8,530	55	3	68	37	72	122
Whitendale Avenue	Shirk Street to Akers Road	3,240	45	2	61	<30	<30	57
	Akers Road to Demaree Street	6,340	45	3	64	<30	45	83
	Demaree Street to SR63	14,000	45	3	68	34	69	120
	SR 63 to Court Street	12,110	45	2	67	<30	62	106
Walnut Avenue	Shirk Street to Akers Road	6,140	55	3	67	<30	61	105
	Akers Road to Demaree	18,280	45	3	69	42	79	136
	Demaree to SR63	16,010	45	3	68	38	74	127
	SR 63 to Court Street	17,230	45	3	69	41	77	132
	Court Street to Ben Maddox Way	15,690	40	3	67	<30	63	110
	Ben Maddox Way to Lovers Lane	13,010	45	2	67	<30	64	110
	Lovers Lane to Road 148	10,060	50	2	67	<30	65	111

Table 3.10-5: 2010 Traffic Data and Noise Levels

Roadway	*Segment Location*	*Existing Average Daily Traffic Volume**	*Speed*	*Truck %*	*L_{dn} at 50 Feet from Roadway Centerline*	*Distance to Contour (feet)*		
						70 L_{dn}	*65 L_{dn}*	*60L_{dn}*
	east of Road 148	5,850	55	2	66	<30	58	98
SR 198	west of Road 80	39,930	65	8	78	125	222	394
	Road 80 to Shirk Street	44,990	65	8	79	132	236	418
	Shirk Street to Akers Road	49,010	65	8	79	138	246	437
	Akers Road to Demaree Street	57,590	65	8	80	150	266	473
	Demaree Street to SR63	62,890	65	8	80	157	279	492
	SR 63 to Court Street	61,060	65	8	80	155	274	485
	Court Street to Ben Maddox Way	64,220	65	8	80	158	282	497
	Ben Maddox Way to Lovers Lane	41,610	65	8	78	128	227	403
	Lovers Lane to Road 148	29,780	65	8	77	109	192	342
	east of Road 148	29,780	65	8	77	109	192	342
Goshen Avenue	west of Road 80	7,500	55	5	68	37	73	124
	Road 80 to Shirk Street	19,780	55	5	72	66	114	200
	Shirk Street to Akers Road	22,660	55	5	73	71	122	215
	Akers Road to Demaree Street	17,560	55	5	72	62	107	189
	Demaree Street to Mooney Boulevard	13,280	55	5	71	54	94	164
	Mooney Boulevard to Court Street	8,660	45	3	66	<30	54	95
	Court Street to Ben Maddox Way	5,450	45	3	64	<30	41	78
Houston Avenue (SR216)	Demaree Street to Mooney Boulevard	9,030	45	3	66	<30	56	96
	Mooney Boulevard to Court Street	11,620	45	3	67	<30	63	109
	Court Street to Bridge Street	11,880	45	3	67	<30	64	111

Table 3.10-5: 2010 Traffic Data and Noise Levels

Roadway	*Segment Location*	*Existing Average Daily Traffic Volume**	*Speed*	*Truck %*	*L_{dn} at 50 Feet from Roadway Centerline*	*Distance to Contour (feet)*		
						70 L_{dn}	*65 L_{dn}*	*60L_{dn}*
	Bridge Street to Lovers Lane	6,300	35	4	62	<30	<30	64
	Lovers Lane to Road 148	12,590	35	5	65	<30	52	95
	east of Road 148	5,150	55	3	66	<30	56	96
Riggin Road	west of Road 80	5,470	55	3	66	<30	58	99
	Road 80 to Shirk Street	5,880	55	3	67	<30	60	102
	Shirk Street to Akers Road	7,280	45	5	66	<30	54	95
	Akers Road to Demaree Street	11,790	45	5	68	33	69	121
	Demaree Street to Mooney Boulevard	14,460	45	5	68	40	77	134
	Mooney Boulevard to Court Street	11,610	45	5	68	33	68	121
	Court Street to Bridge Street	5,100	45	4	64	<30	41	78
	Bridge Street to Lovers Lane	4,820	45	3	63	<30	37	73

Note: *2010 Traffic Volumes are based upon the TCAG 2010 Traffic Model

Source: ICF 2010

Railways

Railroad activity in the City occurs along two railroad lines: the Union Pacific Railroad (formerly the Southern Pacific) and the Burlington Northern Santa Fe (formerly the Atchinson, Topeka, and Santa Fe Railroad). Train movements occur on the Union Pacific Railroad approximately 5 times per week during daytime hours. Trains will usually have one engine and 20 cars. There are typically no train movements between the hours of 10:00 p.m. to 7:00 a.m., and train speeds are restricted to 10mph. Train movements rarely occur on the Burlington Northern Santa Fe Railroad (Omni Means, 2010).

Table 3.10-6 summarizes train noise levels along the Union Pacific Railroad track.

Table 3.10-6: Existing Noise Levels Along Union Pacific Railroad Track

Ldn at 100 Feet	*Distance to Contour*		
	60 Ldn	*65 Ldn*	*70 Ldn*
58 Ldn	69 feet	32 feet	15 feet

Source: Omni Means, 2010; ICF, 2012

Where grade crossings exist, and warning horns and crossing alarms are signaled, individual single event noise levels associated with a train generally will increase by approximately 10 dB. Warning horns generally are signaled within one-quarter mile of a grade crossing. Therefore, Ldn values are expected to increase between 5 dB and 10 dB above those reported in Table 3.10-6, within one-quarter mile of a railroad grade crossing.

Airports

The Visalia Municipal Airport is the only airport in Tulare County that has scheduled airline service. The noise impacts from these public airports were analyzed in the 2004 Airport Master Plan. Current average daily activity is estimated at 71 takeoffs and landings and approximately 26,000 operations per year. The projected 2019 total activity level is 90 takeoffs and landings and approximately 33,000 operations per year.

The Airport Master Plan establishes procedures and criteria for reviewing proposed development in the Airport environs. All land uses located outside of the 65 dB CNEL contours are considered compatible. However, residential and lodging land uses located inside the 65 CNEL contour are considered to be incompatible uses and could generate complaints. This can be expected because the background noise levels, absent of aircraft overflights, are low. Maximum noise levels due to typical single engine aircraft overflights can range between 65 dB and 80 dB, which may be annoying to individuals.

The Airport Master Plan (Shutt Moen Associates 2004) reported CNEL contours for 1999 and projected (2019) average daily airport activity levels. (**Figure 3.10-1** and **Figure 3.10-2**). Contours for current 2012 conditions are not available but likely lie between the 1999 and 2019 contours.

Major Stationary Noise Sources

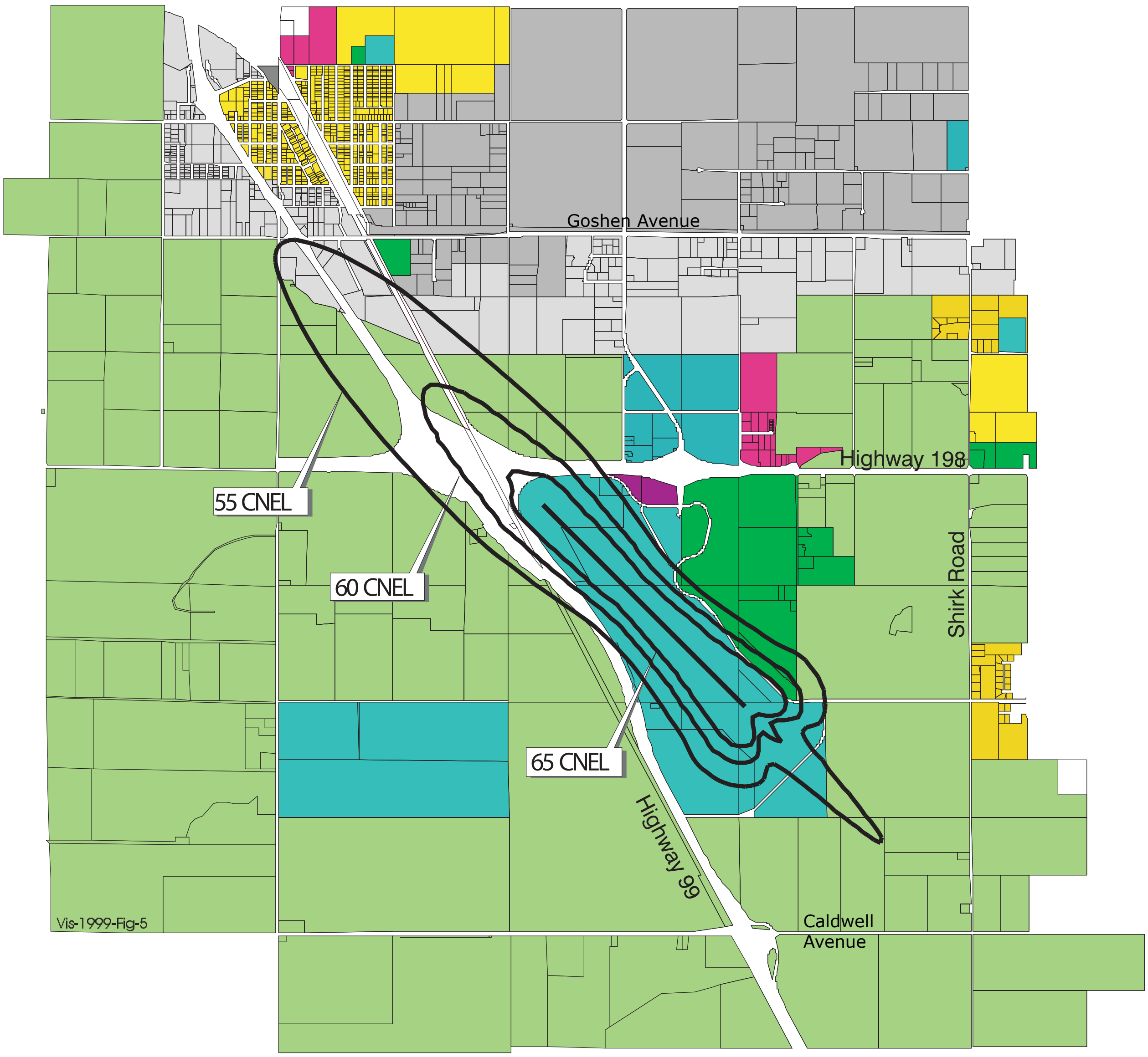
Commercial, industrial, agricultural, and recreational uses can be a source of stationary noise. The following operations have been identified as major stationary noise sources in and around Visalia (Dyett & Bhatia 2010).

- California Dairies
- Advanced Food Products
- Walnut Dryers/Hullers
- Plaza Park Raceway
- Visalia Rawhide Baseball Stadium
- School Stadiums
- Precision Pet Foods

Figure 3.10-1:

Airport Noise Contours 1999

Visalia Municipal Airport



Land Use Designations

- Agriculture
- Business Research Park
- Conservation
- Central Business District
- Highway Commercial
- Service Commercial
- Heavy Industry
- Light Industry
- Park
- Public Institutional
- Rural Residential
- Residential Low Density

4000

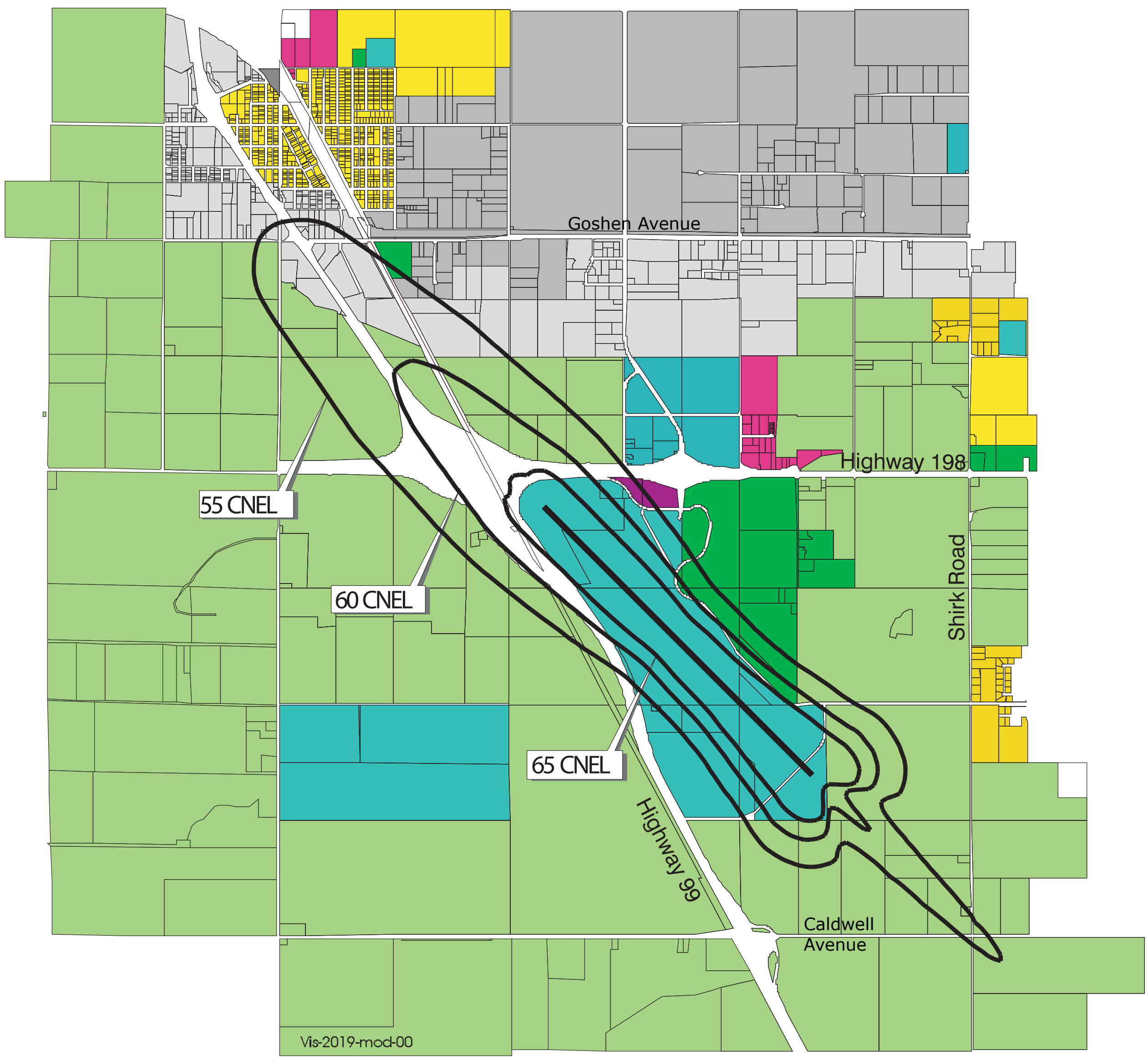
0 FEET 8000

Source: Shutt Moen Associates (May 1998)

Figure 3.10-2:

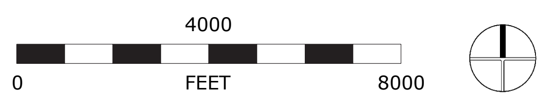
Airport Noise Contours 2019

Visalia Municipal Airport



Land Use Designations

- Agriculture
- Business Research Park
- Conservation
- Central Business District
- Highway Commercial
- Service Commercial
- Heavy Industry
- Light Industry
- Quasi-Public (Park)
- Quasi-Public
- Rural Residential
- Residential Low Density



Source: Shutt Moen Associates (May 1998)

Existing Noise Conditions-Community Noise Survey

A community noise survey was conducted to document existing noise in the city. Noise monitoring sites were selected to be representative of typical residential, commercial, or recreational areas within the city (see **Tables 3.10-7 and 3.10-8**).

Short-term noise monitoring was conducted at eight sites on April 15 and 16, 2010. Continuous long-term 24-hour noise monitoring was also conducted at 3 sites in the city to record day-night statistical noise level trends and to develop L_{dn} values. The data collected included the hourly average (L_{eq}) the maximum level (L_{max}), and the minimum level (L_{min}) during the measurement period. The calibration of sound level meters used for both short-term and long-term measurements was checked in the field before and after each measurement with an acoustical calibrators. The equipment used complies with all pertinent requirements of the American National Standards Institute (ANSI) for Type I or Type II sound level meters.

Short-term noise monitoring results are summarizes in **Table 3.10**-7. Long-term monitoring results are summarized in **Table 3.10-8**.

Table 3.10-7: Short-Term Noise Measurements (2010)

				Measured Sound Level, dB		
Site	*Location*	*Date*	*Time*	L_{eq}	L_{min}	L_{max}
1	Community Campus, 220 NW 3rd Ave	4/15/10	15 minutes	53.5	45.1	65.1
2	Golden West High School 1717 N. McAuliff	4/15/10	15 minutes	49.8	42.2	62.1
3	Rec Park/Rawhide Stadium	4/15/10	15 minutes	50.7	45.2	60.8
4	College of the sequoias, 915 S. Mooney at Mineral King	4/15/10	15 minutes	50.3	47.1	58.9
5	Jefferson Park, Myrtle and S Watson	4/15/10	15 minutes	53.8	47.8	66.6
6	Willow Glen School, 310 N Akers	4/15/10	15 minutes	55.1	47.1	65.1
7	Crestwood School, 3001 W Whitendale Ave	4/15/10	15 minutes	54.9	46.3	70.2
8	Highway 198 and Lovers Lane	4/15/10	15 minutes	67.0	57.6	82.6

Source: ICF, 2010

Table 3.10-8: Long-Term Noise Measurements Results (April 15, 2010)

Site	*Location*	*CNEL*
9	Community Campus, 220 NW 3rd Ave	57.5
10	Golden West High School 1717 N. McAuliff	71.1
11	Rec Park/Rawhide Stadium	51.8

Source: ICF, 2010

REGULATORY SETTING

Federal, State, and local agencies regulate different aspects of environmental noise. In general, the federal government sets noise standards for transportation-related noise sources closely linked to interstate commerce. These include aircraft, locomotives, and trucks. The State government sets noise standards for other transportation noise sources less closely linked with interstate commerce, such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies. While local general plans identify general principles intended to guide and influence noise from development and systems operation, it is typically noise ordinances that set forth the specific standards and procedures for addressing particular noise sources and activities. The following is a summary of federal, state, and local regulations and guidelines related to noise.

Federal

The federal Noise Control Act of 1972 (Public Law 92-574) established a requirement that all federal agencies administer their programs to promote an environment free of noise that would jeopardize public health or welfare. The U.S. Environmental Protection Agency (EPA) was given the responsibility for:

- Providing information to the public regarding identifiable effects of noise on public health and welfare,
- Publishing information on the levels of environmental noise that will protect the public health and welfare with an adequate margin of safety,
- Coordinating federal research and activities related to noise control, and
- Establishing federal noise emission standards for selected products distributed in interstate commerce.

The Noise Control Act also directed that all federal agencies comply with applicable federal, state, interstate, and local noise control regulations.

Although the EPA was given a major role in disseminating information to the public and coordinating federal agencies, each federal agency retains authority to adopt noise regulations pertaining to agency programs. The EPA can, however, require other federal agencies to justify their noise regulations in terms of Noise Control Act policy requirements.

The Occupational Safety and Health Administration retains primary authority for setting workplace noise exposure standards, the Federal Aviation Administration retains primary jurisdiction over aircraft noise standards, the Federal Highway Administration (FHWA) retains primary jurisdiction over highway noise standards, and the Federal Transit Administration (FTA) retains primary jurisdiction over transit noise standards.

In 1974, in response to the requirements of the Noise Control Act, the EPA identified indoor and outdoor noise limits to protect public health and welfare (e.g., communication disruption, sleep disturbance and hearing damage). Day-night average sound level (L_{dn}) limits of 55 decibels (dB) outdoors and 45 dB indoors are identified as desirable to protect against speech interference and sleep disturbance for residential, educational and healthcare areas. Sound-level criteria identified to protect against hearing damage in commercial and industrial areas are 24-hour equivalent sound level (L_{eq}) values of 70 dB (both outdoors and indoors).

Key federal agencies with noise regulations and guidelines include:

- **Housing and Urban Development (HUD):** Noise standards for federally funded housing projects
- **Federal Aviation Administration (FAA):** Noise standards for aircraft noise
- **Federal Highway Administration (FHWA):** Noise standards for federally funded highway projects
- **Federal Transit Administration:** Noise standards for federally funded transit projects
- **Federal Railroad Administration:** Noise standards for federally funded rail projects

State

State of California General Plan Guidelines

The State of California General Plan Guidelines (OPR 2003) identify guidelines for the noise elements of local general plans, including a sound level/land use compatibility chart that categorizes, by land use, outdoor L_{dn} ranges in up to four categories (normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable). For many land uses, the chart shows overlapping L_{dn} ranges for two or more compatibility categories.

The noise element guideline chart identifies the normally acceptable range of Ldn values for low-density residential uses as less than 60 dB and the conditionally acceptable range as 55–70 dB. The normally acceptable range for high-density residential uses is identified as L_{dn} values below 65 dB, and the conditionally acceptable range is identified as 60–70 dB. For educational and medical facilities, L_{dn} values below 70 dB are considered normally acceptable, and L_{dn} values of 60–70 dB are considered conditionally acceptable. For office and commercial land uses, L_{dn} values below 70 dB are considered normally acceptable, and L_{dn} values of 67.5–77.5 are categorized as conditionally acceptable. When noise levels are in the conditionally acceptable range new construction should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation requirements are included in the design.

These overlapping L_{dn} ranges are intended to indicate that local conditions (existing sound levels and community attitudes toward dominant sound sources) should be considered in evaluating land use compatibility at specific locations.

California Noise Insulation Standards

Part 2 Title 24 of the California Code of Regulations "California Noise Insulation Standards" establishes minimum noise insulation standards to protect persons within new hotels, motels, dormitories, long-term care facilities, apartment houses, and dwellings other than single family residences. Under this regulation interior noise levels attributable to exterior noise sources cannot exceed 45 L_{dn} in any habitable room. Where such residences are located in an environment where exterior noise is 60 L_{dn} or greater, an acoustical analysis is required to ensure that interior levels do not exceed the 45 L_{dn} interior standard.

Division of Aeronautics Noise Standards

Title 21 Chapter 5000 of the California Code of Regulations identifies noise compatibility standards for airport operations. Section 5014 of the code states that the standard for the acceptable level of aircraft noise for persons living in the vicinity of airports is established to be a community noise equivalent level of 65 decibels. Land uses such a residences, schools, hospitals, or places of worship exposed to aircraft noise exceeding 65 dB CNEL are deemed to be in a noise impact area. This standard forms the basis for the limitation that no airport proprietor shall operate an airport with a noise impact area based on the standard of 65 dB CNEL unless the operator has applied for or received a variance.

City of Visalia

Current General Plan Noise Element

The current noise element of the City's General Plan establishes goals and policies intended to limit community exposure to excessive noise levels. Visalia's current General Plan identifies noise sources such as roadways, rails, and airports within the city and includes land use compatibility guidelines. In addition, Implementation Policy 2.2 states that an acoustical analysis may be required if existing or projected future noise exposure at the exterior of buildings which will contain noise sensitive uses or within proposed outdoor activity areas exceeds 65 dB, Ldn, or if interior noise levels resulting from offsite noise are estimated to exceed 45 dBA.

Noise Ordinance

Section 8.36 of the City's Municipal Code contains the City's noise ordinance, which establishes exterior and interior noise level standards. Exterior and interior noise levels may not exceed any of the categorical noise level standards shown in **Table 3.10-9**:

Table 3.10-9: City of Visalia Noise Level Standards, dBA

Category	*Cumulative number of minutes in any one hour time period*	*Evening and daytime (6:00 a.m. to 7:00 p.m.)*	*Nighttime (7:00 p.m. to 6:00 a.m.)*
Exterior Levels			
1	30	50	45
2	15	55	50
3	5	60	55
4	1	65	60
5	0	70	65
Interior Levels			
1	5	45	35
2	1	50	40
3	0	55	45

Source: City of Visalia, 2010

Impact Analysis

In this section noise and vibration impacts associated with implementation of the proposed General Plan are discussed.

Significance Criteria

Implementation of the general plan update would result in a significant impact if it would:

1. Expose noise sensitive land uses to construction noise or groundborne vibration in excess of existing City standards
2. Expose new noise sensitive land uses to noise in excess of standards found in the existing Visalia General Plan Noise Element
3. Expose existing noise sensitive land uses to an increase in noise that results in noise in excess of standards found in the existing Visalia General Plan Noise Element

METHODOLOGY AND ASSUMPTIONS

Existing and Future (Year 2030) traffic noise levels from the Visalia's major roadways were modeled using the FHWA Highway Traffic Noise Model (TNM) version 2.5 and traffic data provided by the project traffic consultant. Existing traffic noise modeling is intended to establish a baseline for existing noise conditions and for comparison with future conditions. The TNM model inputs include vehicle volumes, vehicle mix (percentage of autos, mediums trucks, and heavy trucks), speed, roadway configuration, distance to the receiver, and ground attenuation factors.

The modeled traffic noise level at 50 feet from the roadway centerline and distances from the centerlines of selected roadways to the 60 dB, 65 dB, and 70dB L_{dn} contours are summarized above in **Table 3.10-5**. In many cases, the actual distances to noise level contours may vary from the distances predicted by the FHWA model. Factors such as roadway curvature, roadway grade, shielding from local topography or structures, elevated roadways, or elevated receivers may affect actual sound propagation. For the purposes of this analysis, it was assumed that all areas are flat, that the roadways and receivers are at the same elevation, and that there is no intervening terrain, structures, or walls between the roadways and the receivers. Thus, the modeled data represents a conservative, worst-case estimate of traffic noise in the City.

IMPACT SUMMARY

Proposed Project Impact	*Mitigation Measure*	*Significance after Mitigation*
Exposure of existing or planned noise-sensitive uses to construction noise and groundborne vibration	None required	Less than significant
Exposure of new noise sensitive land uses noise in excess of standards found in the existing Visalia General Plan Noise Element	None required	Less than significant
Exposure of existing noise sensitive land uses to an increase in noise that results in noise in excess of standards found in the existing Visalia General Plan Noise Element	None available	Significant and unavoidable
Exposure of existing or new noise sensitive land uses to noise in excess of standards found in the existing Visalia General Plan Noise Element as a result of changes in general plan noise policies and standards	None required	Less than significant

IMPACTS AND MITIGATION MEASURES

Impact

3.10-1 Exposure of existing or planned noise-sensitive uses to construction noise and groundborne vibration (*Less than Significant*)

Implementation of the proposed General Plan will result in construction activities that could generate temporary noise and groundborne vibration. **Table 3.10-10** summarizes typical noise levels produced during key construction phases for various types of projects (EPA 1972). Typical vibration levels are shown in **Table 3.10-2** (FTA 2006).

Table 3.10-10: Typical Construction Noise Levels

Construction Phase	*Sound Level at 50 Feet (dB)*			
	Housing	*Industrial*	*Public Works*	*Non-Residential*
Ground Clearing	85	87	88	91
Excavation	89	90	90	87
Foundations	82	89	92	87
Building/Facility Construction	81	85	88	88
Finishing and Clean-up	86	89	90	87

Source: EPA 1971

Construction activities associated with new development would be temporary in nature and related noise impacts would be short-term. However, since construction activities could substantially increase ambient noise levels at noise-sensitive locations, construction noise could result in potentially significant impacts to sensitive receptors. Groundborne vibration impacts associated with construction activities are also temporary in nature. Depending on the type of construction related machinery used, construction activity can result in varying degrees of vibration. Activities such as pile-driving, blasting, drilling, and excavation have the highest potential for creating groundborne vibration impacts. The potential construction-related noise and vibration impacts depend on the proximity of construction activities to sensitive receptors, the presence of intervening barriers, the number, and the types and duration of construction equipment used.

Development under the proposed General Plan would be required to comply with noise limitations specified in Section 8.36 of the City's Municipal Code (**Table 3.10-9**).

Proposed General Plan Policies that Reduce the Impact

None of the proposed General Plan policies relate to construction noise or vibration, as the General Plan is a long-range policy document, and construction-related noise and vibration is addressed through municipal code and project-level analysis.

Compliance with the existing City Municipal Code Section 8.36 would ensure that construction noise impacts would be less than significant. Measures such as maintaining minimum setback distances between construction equipment and receptors implemented to avoid significant construction noise impacts would be expected to avoid significant construction vibration impacts as well.

Mitigation Measures

None required.

3.10-2 Exposure of new noise sensitive land uses noise in excess of standards found in the existing Visalia General Plan Noise Element (*Less than Significant*)

Implementation of the General Plan will result in increased traffic and traffic noise. **Table 3.10-5** above summarizes predicted traffic noise levels along major roadways in the Planning Area under build out of the proposed plan.

Implementation of the proposed General Plan is not expected to change the small amount of rail activity that currently occurs in the City. As indicated in **Figure 3.10-1** and **Figure 3.10-2**, aircraft activity and the aircraft noise around the Visalia Municipal Airport is expected to increase relative to existing conditions resulting in more area southeast of the airport being exposed to noise in excess of 65 Ldn. There is currently no development in this area. It is likely that the number of stationary sources of noise in the City will increase as well with implementation of the proposed plan.

New residential development or other noise sensitive uses could potentially be located in areas exposed to noise in excess of the City's land use compatibility standard of 65 Ldn. This would result in a significant noise impact.

Proposed General Plan Policies that Reduce the Impact

N-P-3 Establish performance standards for noise reduction for new housing that may be exposed to community noise levels above 65 dB DNL/CNEL, as shown on the Noise Contour Maps, based on the target acceptable noise levels for outdoor activity levels and interior spaces in Tables 8-2 and 8-3. Noise mitigation measures that may be considered to achieve these noise level targets include but are not limited to the following:

- Construct façades with substantial weight and insulation;
- Use sound-rated windows for primary sleeping and activity areas;
- Use sound-rated doors for all exterior entries at primary sleeping and activity areas;
- Use minimum setbacks and exterior barriers;
- Use acoustic baffling of vents for chimneys, attics and gable ends;
- Install a mechanical ventilation system that provides fresh air under closed window conditions.

Alternative acoustical designs that achieve the prescribed noise level standards may be approved, provided that a qualified Acoustical Consultant submits information demonstrating that the alternative designs will achieve and maintain the specific targets for outdoor activity areas and interior spaces.

N-P-4 Where new development of industrial, commercial or other noise generating land uses (including roadways, railroads, and airports) may result in noise levels that exceed the noise level exposure criteria established by Tables 8-2 and 8-3, require a noise study to determine impacts, and require developers to mitigate these impacts in conformance with Tables 8-2 and 8-3 as a condition of permit approval through appropriate means.

Noise mitigation measures may include but are not limited to:

- Screen and control noise sources, such as parking and loading facilities, outdoor activities, and mechanical equipment;
- Increase setbacks for noise sources from adjacent dwellings;
- Retain fences, walls, and landscaping that serve as noise buffers;
- Use soundproofing materials and double-glazed windows;
- Use open space, building orientation and design, landscaping and running water to mask sounds; and
- Control hours of operation, including deliveries and trash pickup, to minimize noise impacts.

Alternative acoustical designs that achieve the prescribed noise level reduction may be approved, provided a qualified Acoustical Consultant submits information demonstrating that the alternative designs will achieve and maintain the specific targets for outdoor activity areas and interior spaces. As a last resort, developers may propose to construct noise walls along state highways and arterials when compatible with aesthetic concerns and neighborhood character. This would be a developer responsibility, with no City funding.

N-P-5 Continue to enforce applicable State Noise Insulation Standards (California Administrative Code, Title 24) and Uniform Building Code (UBC) noise requirements.

Compliance with the proposed General Plan policies would ensure that noise impacts to new noise sensitive land uses would be less than significant.

Mitigation Measures

None required.

3.10-3 Exposure of existing noise sensitive land uses to an increase in noise that results in noise in excess of standards found in the existing Visalia General Plan Noise Element (*Significant and Unavoidable*).

Table 3.10-11 compares predicted traffic noise levels with build out of the proposed plan to existing traffic noise levels along major roadways in the City. There are 11 roadway segments where existing traffic noise levels are less than 65 Ldn and implementation of the proposed plan will increase traffic noise to be in excess of 65 Ldn. Residences or other noise-sensitive uses along these roadways would be exposed to significant noise impacts because traffic noise would increase to a level that is in excess of the City's 65 Ldn land use compatibility standard.

Table 3.10-11: Comparison of 2030 Traffic Levels to Existing Noise Levels

		L_{dn} at 50 feet		
Roadway	*Segment Location*	*Existing*	*Future*	*Change*
North/South Roads				
SR99	south of Avenue 272	83.9	86.5	2.5
	Avenue 272 to Caldwell Avenue	83.9	86.5	2.5
	Caldwell Avenue to SR 198	84.2	86.6	2.5
	SR 198 to Riggin Avenue	84.3	86.3	2.0
	north of Riggin Avenue	84.0	86.0	1.9
Plaza Drive	Walnut Avenue to SR 198	59.4	63.3	3.9
	SR 198 to Goshen Avenue	69.8	72.1	2.3
	Goshen Avenue to Riggin Road	67.9	71.4	3.5
	north of Riggin Road	65.1	69.8	4.7
Shirk Road	Avenue 272 to Caldwell Avenue	59.9	66.9	7.0*
	Caldwell Avenue to Whitendale	66.4	72.9	6.5
	Whitendale to Walnut	66.9	73.2	6.3
	Walnut to SR198	67.0	73.6	6.6
	SR198 to Goshen Avenue	70.3	74.2	4.0
	Goshen Avenue to Riggin Road	68.6	73.8	5.2
	north of Riggin Road	51.2	67.8	16.6*
Akers Street	south of Avenue 272	68.8	71.9	3.1
	Avenue 272 to Caldwell Avenue	66.6	69.6	2.9
	Caldwell Avenue to Whitendale Avenue	68.6	70.9	2.3
	Whitendale Avenue to Walnut Avenue	69.8	71.6	1.8
	Walnut Avenue to SR198	71.5	72.3	0.8
	SR198 to Goshen Avenue	72.1	72.7	0.6
	Goshen Avenue to Riggin Road	70.0	72.4	2.4
	north of Riggin Road	66.2	72.4	6.1
Demaree Street	south of Avenue 272	69.3	73.3	4.0
	Avenue 272 to Caldwell Avenue	67.6	71.4	3.9
	Caldwell Avenue to Whitendale Avenue	68.9	70.4	1.5
	Whitendale Avenue to Walnut Avenue	68.2	69.1	0.9
	Walnut Avenue to State Route 198	68.6	69.7	1.0
	SR198 to Goshen Avenue	68.2	69.3	1.1
	Goshen Avenue to Houston Avenue	70.5	71.3	0.8
	Houston Avenue to Riggin Avenue	71.8	71.2	-0.6
	north of Riggin Road	66.5	68.7	2.2

Table 3.10-11: Comparison of 2030 Traffic Levels to Existing Noise Levels

		L_{dn} at 50 feet		
Roadway	*Segment Location*	*Existing*	*Future*	*Change*
Mooney Blvd (SR 63)	south of Avenue 272	68.2	70.0	1.8
	Avenue 272 to Caldwell Avenue	70.5	71.3	0.8
	Caldwell Avenue to Whitendale Avenue	70.3	70.3	-0.1
	Whitendale Avenue to Walnut Avenue	69.4	70.6	1.2
	Walnut Avenue to Tulare Avenue	70.0	70.5	0.5
	Tulare Avenue to SR198	70.7	71.6	0.9
	SR198 to Main Street	70.9	70.4	-0.5
Court Street	Avenue 272 to Caldwell Avenue	67.5	68.0	0.4
	Caldwell Avenue to Whitendale Avenue	66.5	68.6	2.1
	Whitendale Avenue to Walnut Avenue	67.9	69.7	1.9
	Walnut Avenue to Tulare Avenue	65.5	66.5	1.0
	Tulare Avenue to SR198	64.0	65.0	1.0
Ben Maddox Way	Avenue 272 to Caldwell Avenue	NA	62.4	NA
	Caldwell Avenue to Walnut Avenue	65.5	65.7	0.2
	Walnut Avenue to Tulare Avenue	66.7	67.1	0.4
	Tulare Avenue to SR198	68.4	68.4	0.1
	SR198 to Goshen Avenue	69.9	70.7	0.7
	Goshen Avenue to SR 216	67.7	68.4	0.8
	SR 216 to Riggin Road	64.0	64.6	0.5
	north of Riggin Road	63.2	65.4	2.2*
Lovers Lane	south of Avenue 272	69.6	71.8	2.2
	Avenue 272 to Caldwell Avenue	69.7	71.4	1.7
	Caldewell Avenue to Walnut Avenue	70.0	71.5	1.5
	Walnut Avenue to Tulare Avenue	69.9	70.9	1.1
	Tulare Avenue to SR198	70.8	71.3	0.5
	SR198 to Goshen Avenue	71.0	70.7	-0.3
	Goshen Avenue to SR 216	69.4	69.6	0.2
	SR 216 to Riggin Road	64.8	66.8	2.0*
Road 148	Avenue 272 to Caldwell Avenue	62.7	68.3	5.6*
	Caldewell Avenue to Walnut Avenue	62.2	68.0	5.8*
	Walnut Avenue to SR198	64.1	69.5	5.4*
	SR198 to SR216	NA	69.7	NA
East/West Roads				
Avenue 272	SR99 to Shirk Street	60.6	65.4	4.8*

Table 3.10-11: Comparison of 2030 Traffic Levels to Existing Noise Levels

		L_{dn} at 50 feet		
Roadway	*Segment Location*	*Existing*	*Future*	*Change*
	Shirk Street to Akers Road	63.1	69.8	6.7*
	Akers Road to Demaree Street	65.5	69.4	4.0
	Demaree Street to SR63	69.6	70.9	1.3
	SR 63 to Court Street	67.5	70.3	2.8
	Court Street to Bridge Street	67.7	68.7	1.0
	Bridge Street to Lovers Lane	65.7	67.5	1.8
	Lovers Lane to Road 148	66.1	68.2	2.1
Caldwell Avenue	SR99 to Shirk Street	68.6	74.0	5.4
	Shirk Street to Akers Road	69.3	73.3	4.0
	Akers Road to Demaree Street	69.3	71.0	1.6
	Demaree Street to SR63	70.7	72.1	1.3
	SR 63 to Court Street	71.4	72.1	0.7
	Court to Ben Maddox Way	70.4	70.9	0.5
	Ben Maddox Way to Lovers Lane	68.2	68.9	0.7
	Lovers Lane to Road 148	68.1	69.2	1.1
Whitendale Avenue	Shirk Street to Akers Road	61.1	64.5	3.4
	Akers Road to Demaree Street	64.3	64.7	0.4
	Demaree Street to SR63	67.7	67.5	-0.2
	SR 63 to Court Street	66.7	66.8	0.0
Walnut Avenue	Shirk Street to Akers Road	66.7	68.7	2.0
	Akers Road to Demaree	68.9	69.4	0.5
	Demaree to SR63	68.3	68.3	0.0
	SR 63 to Court Street	68.6	68.8	0.2
	Court Street to Ben Maddox Way	66.8	68.0	1.2
	Ben Maddox Way to Lovers Lane	67.0	68.1	1.0
	Lovers Lane to Road 148	67.3	70.0	2.7
	east of Road 148	66.2	68.4	2.2
SR 198	west of Road 80	78.1	80.1	2.0
	Road 80 to Shirk Street	78.6	80.0	1.3
	Shirk Street to Akers Road	79.0	80.7	1.7
	Akers Road to Demaree Street	79.7	81.2	1.5
	Demaree Street to SR63	80.1	81.6	1.6
	SR 63 to Court Street	80.0	81.1	1.1
	Court Street to Ben Maddox Way	80.2	81.0	0.8

Table 3.10-11: Comparison of 2030 Traffic Levels to Existing Noise Levels

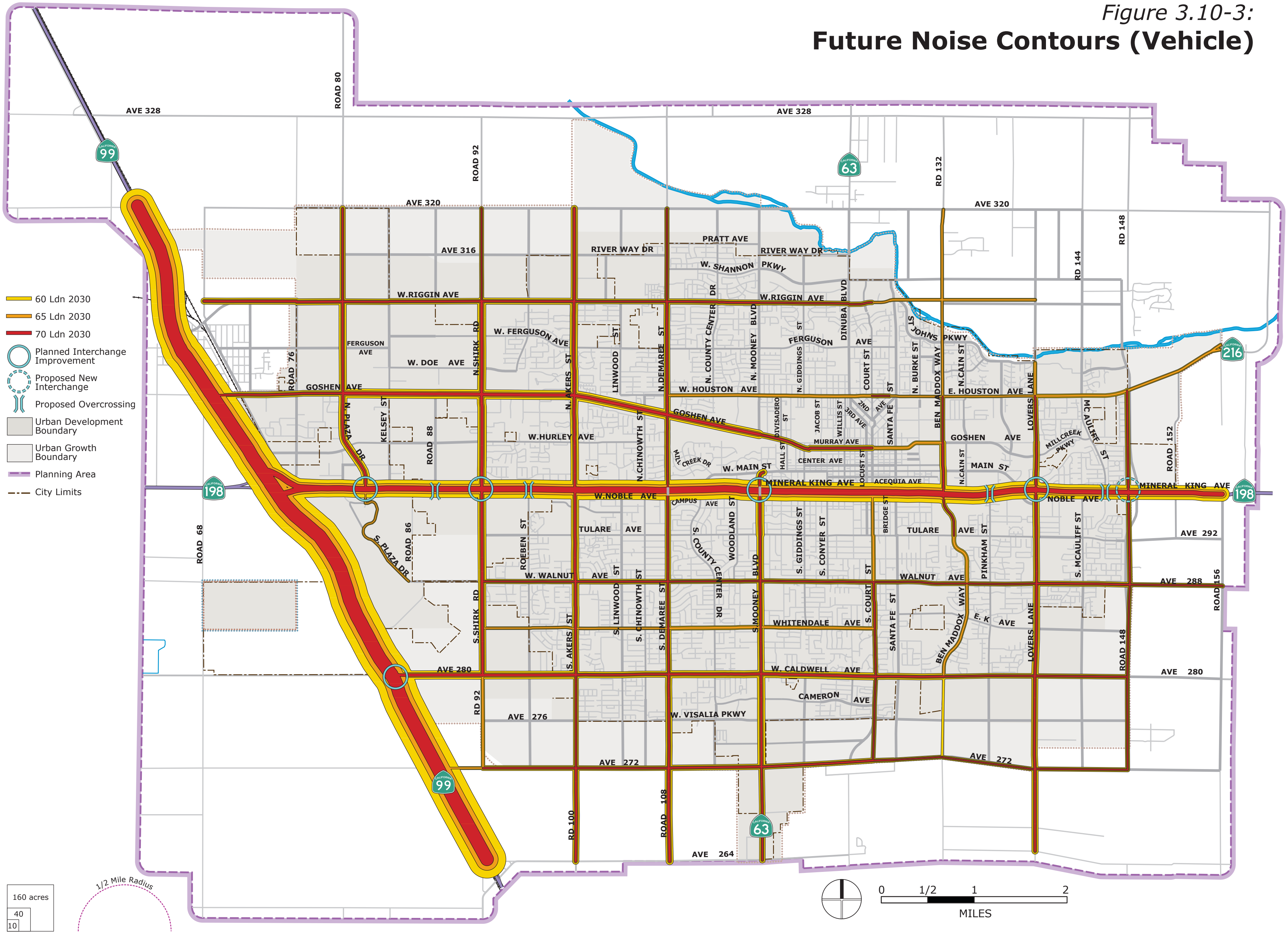
		L_{dn} at 50 feet		
Roadway	*Segment Location*	*Existing*	*Future*	*Change*
	Ben Maddox Way to Lovers Lane	78.3	80.2	1.9
	Lovers Lane to Road 148	76.9	78.4	1.6
	east of Road 148	76.9	78.4	1.6
Goshen Avenue	west of Road 80	68.1	70.7	2.7
	Road 80 to Shirk Street	72.3	74.7	2.5
	Shirk Street to Akers Road	72.9	74.8	2.0
	Akers Road to Demaree Street	71.8	75.1	3.4
	Demaree Street to Mooney Boulevard	70.5	74.1	3.6
	Mooney Boulevard to Court Street	65.6	70.6	4.9
	Court Street to Ben Maddox Way	63.7	67.3	3.7*
Houston Avenue (SR216)	Demaree Street to Mooney Boulevard	65.8	66.0	0.1
	Mooney Boulevard to Court Street	66.9	66.6	-0.3
	Court Street to Bridge Street	67.0	68.1	1.1
	Bridge Street to Lovers Lane	61.9	64.0	2.0
	Lovers Lane to Road 148	65.3	66.6	1.3
	east of Road 148	65.9	66.3	0.4
Riggin Road	west of Road 80	66.2	71.8	5.6
	Road 80 to Shirk Street	66.5	71.0	4.4
	Shirk Street to Akers Road	65.5	71.0	5.4
	Akers Road to Demaree Street	67.6	69.2	1.6
	Demaree Street to Mooney Boulevard	68.5	70.0	1.5
	Mooney Boulevard to Court Street	67.5	68.7	1.1
	Court Street to Bridge Street	63.7	63.9	0.2
	Bridge Street to Lovers Lane	63.1	65.5	2.3*

*Existing noise level is less than 65 L_{dn} and implementation of plan increases noise to greater than 65 L_{dn}.

Source: ICF 2012

Figure 3.10-3:

Future Noise Contours (Vehicle)



As indicated in **Figures 3.10-2** and **3.10-3**, the area exposed to 65 L_{dn} as a result of increased activity at Visalia Municipal Airport will increase southeast of the airport. However, there are no existing noise-sensitive land uses in that area. The increase in noise in this area would, therefore, be less than significant.

Proposed General Plan Policies that Reduce the Impact

N-P-2 *Promote the use of noise attenuation measures to improve the acoustic environment inside residences where existing residential development is located in a noise-impacted environment such as along an arterial street or adjacent to a noise-producing use.

Although implementation of Policy N-P-2 would reduce this impact by reducing or preventing significant increases in ambient noises for sensitive land uses, it would not be feasible in all situations to reduce this impact to a less-than-significant level. For example, noise attenuation measures such as sound walls and berms would be infeasible or inappropriate in locations where sensitive land uses already exist. Factors that would render these and other noise attenuation measures infeasible include but are not limited to property access, cost, aesthetic considerations, and negative impacts to pedestrian and bicycle connectivity, and impacts to driver visibility. This impact, therefore, is significant and unavoidable.

Mitigation Measures

None available.

3.10-4 Exposure of existing or new noise sensitive land uses to noise in excess of standards found in the existing Visalia General Plan Noise Element as a result of changes in general plan noise policies and standards (*Less than Significant*)

Tables **10.3-12** and **10.3-13** show the new noise compatibility standards proposed in the General Plan Update. For residential uses these standards are the same as the existing General Plan. The new standards include additional noise-sensitive uses and standards for stationary sources. The proposed noise policies and standards would provide protection that is the same or better than provided in the existing General Plan policies and standards. This impact is, therefore, less than significant.

Table 3.10-12: Transportation Noise Sources

Noise-Sensitive Land Use	*Outdoor Activity Areas*[1]	*Interior Spaces*	
	DNL/CNEL[2]*, dB*	*DNL/CNEL*[2]*, dB*	*L_{eq} dB*[3]
Residential	65	45	---
Transient Lodging	65	45	---
Hospitals, Nursing Homes	65	45	---
Theaters, Auditoriums, Music Halls	---	---	35
Churches, Meeting Halls	65	---	45
Office Buildings	---	---	45
Schools, Libraries, Museums	---	---	45

1. Outdoor activity areas generally include backyards of single-family residences and outdoor patios, decks or common recreation areas of multi-family developments.
2. The CNEL is used for quantification of aircraft noise exposure as required by CAC Title 21.
3. As determined for a typical worst-case hour during periods of use.

Table 3.10-13: Stationary Noise Sources[1]

	Daytime (7:00 a.m. – 10:00 p.m.)	*Nighttime (10:00 p.m. – 7:00 a.m.)*
Hourly Equivalent Sound Level (L_{eq}), dBA	50	45
Maximum Sound Level (L_{max}), dBA	70	65

1. As determined at the property line of the receiving noise-sensitive use.

Mitigation Measures

None required.