NOISE ELEMENT

The State of California, in recognition of the relationship between noise and noise – sensitive uses and public health concerns associated with noise, has adopted very specific guidelines for Noise Elements.[1] These guidelines include the requirement for defining projected future noise conditions in the form of noise exposure contours, which present information in a manner similar to a topographic map contours. The noise information serves as the basis for developing guidelines for identifying compatible land uses, identifying the proper distribution of land uses on the General Plan Land Use Map and establishing appropriate development standards.

The interpretation of noise exposure contours is a generalization. Noise measurements, from which noise contours are derived, are affected by many variables such as wind direction and speed, temperature, structures, topography in a particular area at the time the measurement was taken. As such, noise contour lines are not specific boundaries of noise tolerance. Rather noise contour lines indicate where noise sensitive land uses may experience a high level of noise to which a person's ability to communicate, work, recreate, rest and sleep may be affected.

Noise is often defined as annoying or unwanted sound – sound which interferes with person's ability to communicate, work, recreate, rest and sleep. Health studies have shown that excessive noise can cause adverse psychological or physiological effects on human beings. Defining noise problems and establishing a regulatory system that addresses noise which effective requires an understanding of some the basic characteristics of sound and how it affects people and their activities. Some of the most important characteristics of noise are outlined in Table N - 1.

Two parameters are used to technically describe the sound environment at any instant in time – amplitude and frequency. These two characteristics affect the way people respond to sound. While sound levels can be easily measured, the variable in subjective and physical responses to sound complicates the analysis of its impact on people. Sound is created when an object vibrates and radiates part of its energy as acoustic pressure waves through a medium such as air, water or solid.

[1] California Government Code Section 65302(f) and California Health and Safety Code Section 56050.1.

Table N - 1

Noise Characteristics

Noise Characteristic	Units of Measure	Effects on People and Activities
Loudness or Sound Pressure	Energy content of sound waves in the air. Unweighted sound pressure level in decibels (dB)	Noise distracts attention from tasks, interferes with verbal communications and prevents or disturbs sleep. At high levels or for long periods, noise causes temporary or permanent hearing loss. At very high levels, noise can cause pain. Louder sounds have greater effects, subject to the further considerations below.
Frequency of Pitch	Frequency (cycles per second, or Hertz (Hz) of pressure waves. Frequency distribution by octave or 1/3 octave band. Overall sound pressure level weighted by frequency, such as A-weighting (dBA).	The human ear is sensitive to sounds in the range of human speech, less sensitive to high or low frequencies at the same sound energy.
Tonal Content	Pure tones or energy distribution by octave or 1/3 octave frequency band. Special weighting such as effective perceived noise levels in decibels or simple penalty weightings for pure tones.	High tonal content means identifiable whines or hums, which can be particularly annoying compared to random noise of the same sound energy.
Information Content (Music, Voice, Sirens, Etc.)	Judgment that sound includes voice, music, etc. No standard measurement program or weighting.	Information content draws attention to sounds compared to more random noise of the same sound energy.
Impact Noise	Rapid increase in sound pressure or repetitive impacts. Fast response on sound meters used to measure impact noise.	Impact noise (helicopter rotor blade noise, jackhammer, etc.) can be more annoying than other noise of the same sound energy.
Duration of Noise Events as Percentage of 24-Hour or other Period	Hourly or other time averaged energy level (L_{eq}) or statistical sound levels identifying the level exceeded a given percentage of the time.	A noise which last longer or is constant has more impact than one of the same noise energy that occurs only occasionally or for a short period of time.
Degree of Intrusion of Noise Events Over Background Noise Levels	Difference between peak and ambient noise levels. Statistical sound levels, peak noise levels compared to average or ambient.	Individual distinct noise events such as aircraft overflight or loud vehicle pass-by events of given noise level are more intrusive if they occur in a quiet environment.
Time of Day	24-hour or annual average level with weightings for evening and night noise such as CNEL or L_{dn}.	People and their activities are generally more sensitive to noise during the nighttime hours because background noise is generally lower, making noise of a given noise level more intrusive; and sleep is easily interrupted by noise.
Importance of Noise Source	Judgment of social value of noise source.	People are generally willing to accept more disturbance from noise they consider necessary, such as from trash collection, emergency vehicle sirens, etc.

Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). The sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale – a logarithmic loudness scale - is used to quantify sound intensity. Because the human ear is not equally sensitive to all frequencies within the entire spectrum, a noise measurement are weighted more heavily within those frequencies of maximum human sensitivity in a process called "A – Weighting" and is denoted as an A – Weighted Decibel (dBA): dBA. Table N - 2 identifies common noise levels for indoor and outdoor activities and sources.

Table N - 2

Typical Noise Levels

Noise Source	Noise Level dBA	Subjective Evaluation	Noise Environment CNEL
Near Jet Engine	140	Deafening (128 Times as Loud)	**75+ dBA** Extremely noisy urban areas adjacent to freeways or under airport traffic patterns. Hearing damage with constant exposure to noise environment
Civil Defense Siren	130	Threshold of Pain (64 Times as Loud)	
Hard Rock Band	120	Threshold of Feeling Pain (32 Times as Loud)	
Accelerating Motorcycle at a Distance of Several Feet	110	Very Loud (16 Times as Loud)	
Pile Driver Noisy Urban Street / Heavy Traffic	100	Very Loud (8 Times as Loud)	
Ambulance Siren; Food Blender	95	Very Loud	
Garbage Disposal	90	Very Loud (4 Times as Loud)	
Freight Cars, Living Room Music	85	Loud	
Pneumatic Drill; Vacuum Cleaner	80	Loud (2 Times as Loud)	
Busy Restaurant	75	Moderately Loud	**65 – 70 dBA** Very noisy urban areas near highways, arterials and airport.
Near Highway Auto Traffic	70	Moderately Loud	
Commercial Center	65	Moderate	**55 – 65 dBA** Somewhat noisy urban areas, near but not directly adjacent to high volumes of traffic
Average Office	60	Moderate (½ as Loud)	
Suburban Street	55	Moderate	
Light Traffic, Soft Radio Music in Apartment	50	Quiet (1/4 as Loud)	**Below 55 dBA** Relatively quite urban areas, no arterial streets within 1 block, no freeways within ¼ mile.
Large Transformer	45	Quiet	
Average Residence Without Stereo Playing	40	Faint (1/8 as Loud)	
Soft Whisper	30	Faint	
Rustling Leaves	20	Very Faint	
Human Breathing	10	Very Faint (Threshold of Hearing)	

Notes: dBA = A-weighted decibels. CNEL = Community Noise Equivalent.

The human ear can detect changes in sound levels of approximately three dBA and greater under normal conditions and a change of five dBA is typically noticeable to the general public in an outdoor environment. Changes of 1 to 3 dBA are typically unnoticeable by the general public.

Since sensitivity to noise increases during the evening and night – excessive noise interferes with the ability to sleep – 24 hour descriptors have been developed that increase the weighting for noise the occurs during quiet times of the day. The increase is referred to as a penalty. For example, the Community Noise Equivalent Level (CNEL) measures the cumulative noise exposure in a place, with a 5 dB penalty added to evening (7:00 pm to 10:00 pm) and 10 dB penalty added to nighttime (10:00 pm to 7:00 am) noise levels. The Day / Night Average Sound Level L_{dn}) is essentially the same as CNEL with the exception that the evening time period is dropped and all occurrences during this three-hour period is grouped into the daytime period.

ROADWAY CORRIDORS

Roadways and traffic noise are the dominant source of ambient noise in the Planning Area. The major sources of vehicular traffic noise in the Planning Area include Highways 99, 152 and 233 (Robertson Boulevard). The City's network of arterials, major and minor collectors also contribute to the City's ambient traffic noise level.

Traffic noise depends primarily on the speed of traffic and the percentage of truck traffic. Traffic volume also has a major influence on traffic noise levels. The primary source of noise from automobiles is high frequency tire noise, which increases with speed. Trucks produce engine and exhaust noise as well as wind noise. While tire noise from automobiles is generally located at ground level, truck noise sources can be located as high as 10 to 15 feet above the roadbed due to tall exhaust pipes and higher engine placement.

Noise levels from these surface roadways are expected to increase with increased traffic levels anticipated in the Planning Area. Traffic noise level projections were made using the Federal Highway Administration's (FHWA) Highway Noise Prediction Model.[2] The FHWA Model is generally considered to be accurate within 1.5 dB. Table N - 3 identifies the distances measured in feet from the centerline of applicable roadway in the Planning Area to the 60 and 65 dB L_{dn} contours.

Figure N - 1, identifies the noise levels projected by the year 2040 from vehicles traveling on Highway 99 and 152. The actual distance to noise levels contours illustrated in Figure N - 1 may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances identified in Table N - 3 are generally considered to be conservative estimates of noise exposure along roadways in the Planning Area.

[2] United States Department of Transportation, Federal Highway Administration's Highway Traffic Noise Prediction Model (FHWA-RD 77-108).

Table N - 3

2040 Roadway Noise Level Projections

Roadway Segment	Approximate Distance to Roadway L_{dn} Contours (Distance Measured in Feet)	
	65dB	60dB
Highway 99		
North of Pacific View Avenue	1,272	2,741
North of Robertson Boulevard	912	1,965
South of Robertson Boulevard	1,015	2,186
South of East Sierra View Boulevard	1,109	2,390
Highway 152		
West of West Robertson Boulevard	614	1,322
East of West Robertson Boulevard	687	1,480
Highway 223 / Robertson Boulevard		
South of SR 152	49	106
North of SR 152	213	459
East of Moonlight Drive	111	239
East of Montgomery Lake Road	69	150
East of Maze Avenue / Sunrise Street	102	220
East of Palm Parkway	80	172
East of Front Street	88	189
East of North Springs Road	51	109
East of Palm Parkway	80	172
3rd Street		
South of Ventura Avenue	49	105
South of West Robertson Boulevard	32	70
South of Mariposa Avenue	62	133
South of 5th Street	76	163
South of East Palm Parkway	67	144
5th Street		
North of West Robertson Boulevard	25	54
South of West Robertson Boulevard	46	100
15th Street		
North of West Robertson Boulevard	58	126
South of West Robertson Boulevard	49	105
North of East Palm Parkway	67	144
South of East Palm Parkway	39	83
Artesian Avenue		
East of West Robertson Boulevard	43	92

Roadway Segment	Approximate Distance to Roadway L_{dn} Contours (Distance Measured in Feet)	
	65dB	60dB
Chowchilla Boulevard		
South of Pacific View Avenue	69	149
South of West Robertson Boulevard	108	234
North of East Sierra View Boulevard	141	304
Dairy Lane		
South of West Penny Lane	65	140
North of Washington Avenue	37	80
North of Sierra View Boulevard	31	66
Fig Tree Road		
South of East Penny Lane	87	186
Front Street		
South of West Robertson Boulevard	55	119
Kings Avenue		
West of 15th Street	61	131
East of 15th Street	66	142
Legacy Boulevard		
West of 5th Street	62	134
Manzanita Road		
North of East Sierra View Boulevard	66	143
North of East Robertson Boulevard	73	158
Mariposa Avenue		
East of 3rd Street	54	117
Maze Avenue		
West of North Santa Cruz Avenue	66	143
Montgomery Lake Road		
North of East Robertson Boulevard	89	192
Opportunity Road		
North of SR 152	42	90
Pacific View Avenue		
East of SR 99	117	253
West of North Manzanita Road	35	75
Palm Parkway		
East of North Santa Cruz Avenue	45	98
East of West Robertson Boulevard	46	99
Paradise Road		
North of West Artesian Avenue	43	92
Penny Lane		
West of North Dairy Lane	76	164
East of North Chowchilla Boulevard	103	222

Roadway Segment	Approximate Distance to Roadway L_{dn} Contours (Distance Measured in Feet)	
	65dB	60dB
East of North Fig Tree Road	63	135
Prosperity Boulevard		
South of West Robertson Boulevard	55	117
North of East Palm Parkway	17	36
Santa Cruz Avenue		
South of West Palm Parkway	131	282
North of West Palm Parkway	136	294
Sierra View Boulevard		
East of South Dairy Lane	43	92
East of West Robertson Boulevard	57	123
West of SR 99	117	251
East of SR 99	168	362
East of South Manzanita Road	56	121
Springs Road		
North of East Sierra View Boulevard	133	287
North of East Robertson Boulevard	63	135
Sunset Avenue		
South of Washington Avenue	58	125
Sunrise Street		
South of East Sierra View Boulevard	41	87
North of East Sierra View Boulevard	53	115
Ventura Avenue		
West of 3rd Street	64	139
Washington Avenue		
West of West Robertson Blvd.	69	149
West of Paradise Road	28	60

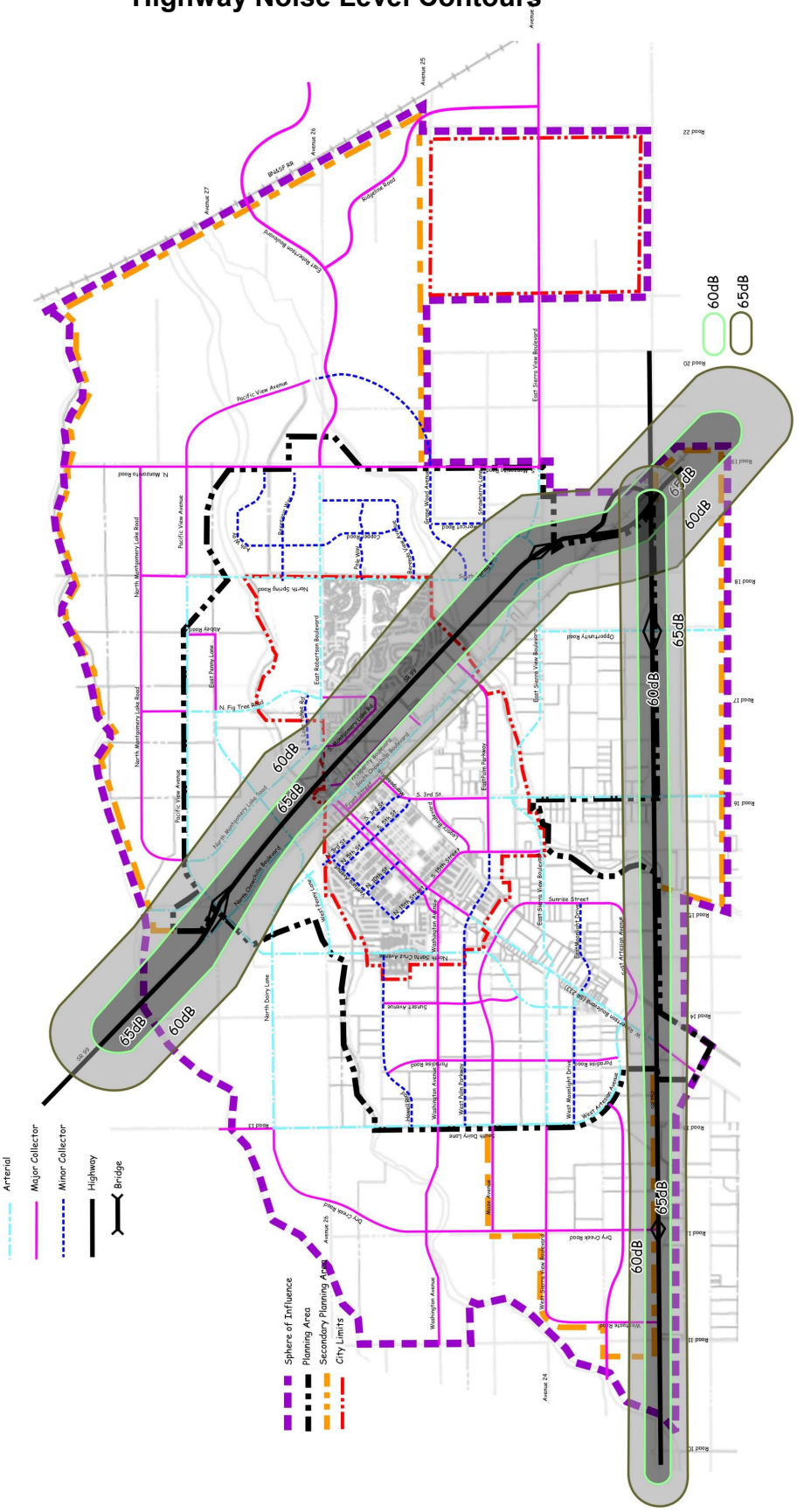
Notes: dB = decibel. L_{dn} = day / night average level.
Source: j.c. brennan & associates, Inc.

RAILROAD CORRIDORS

The Union Pacific Railroad Company (UPRR) and the Burlington Northern Santa Fe Railroad (BNSF) operate rail lines that either traverse or are in proximity of the Planning Area. The UPRR main rail corridor traverses the City in a northwest / southeast direction, roughly parallel with Highway 99. There are also rail spurs and sidings serving a portion of the City's industrial area, west of Highway 99. The BNSF main rail corridor roughly parallels Highway 99, approximately three miles east of Highway 99.

Figure N - 1

Highway Noise Level Contours



There are no BNSF spurs or sidings serving the City. Passenger rail (AMTRAK) service is provided on this rail corridor.

State law and the Federal Railroad Administration operating rules and regulations require locomotive engines to sound the train's horn one-quarter mile in advance of an at-grade crossing and continue to sound the horn until the train arrives at the crossing. If the a train horn is to be an effective warning to motorist, bicyclist and pedestrians, it must provide sound level capable of initiating a response from the motorist, bicyclist and pedestrian as the train approaches the at-grade crossing. The sound level necessary to achieve a level of response and the location of the train relative to the crossing unfortunately creates a significant and annoying sound.

While intermittent, train related operational noise contributes to the ambient noise level in the City due to its magnitude and the associated vibration effects. Train related operational noise incorporates the sounds of the locomotive engine, wheels-on-rail noise and train warning horn blasts near at grade crossings, as well as at-grade crossing arm warning signal sounds. To quantify railroad operational noise exposure in the City, continuous (24-hour) noise level monitoring were conducted along the UPRR and BNSF railroad corridors.[3] The noise level monitoring determined the average number of daily railroad operations, quantified typical sound exposure levels (SEL) for railroad passage and enable the ability to calculate railroad noise levels in terms of day/ night average levels (L_{dn}).

Table N - 4, identifies the distances from the centerline of the railroad corridor measured in feet to the 60, 65 and 70 dB L_{dn} contours. Railroad noise levels increase approximately 1,300 feet northwest and southeast of each at grade crossings due to the use of the train warning horn. Table N - 2 illustrates the average sound exposure levels for train operations along the UPRR mainline rail corridor.

Table N - 4

Railroad Noise Contour Measurements

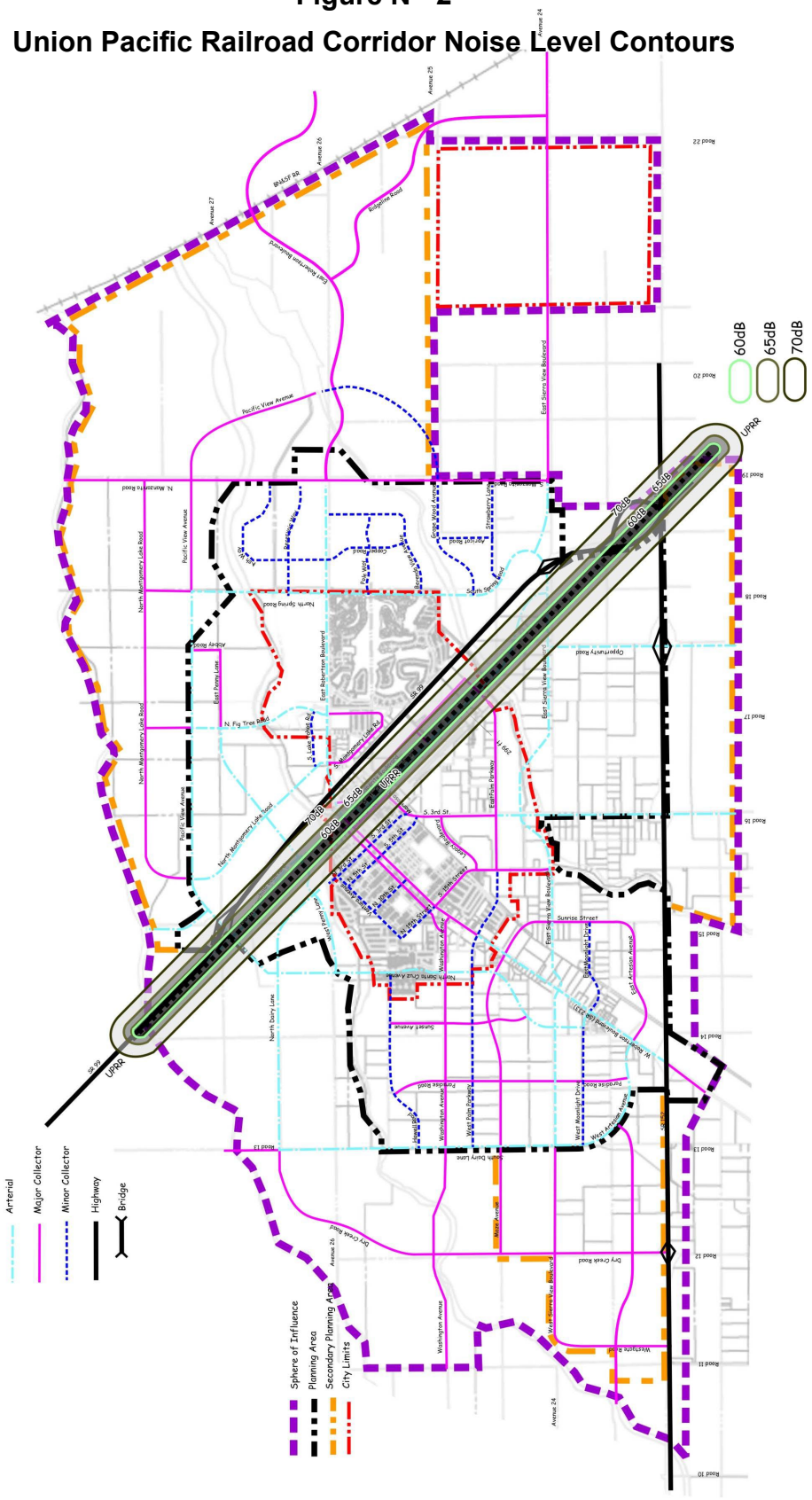
Railroad Corridor	Approximate Distance to Railroad L_{dn} Contours (Distance Measured in Feet)		
	60dB	65dB	70dB
Union Pacific Railroad	1,233	572	286
Burlington Northern Santa Fe Railroad	2,086	968	449

Source: j.c. brennan & Associates, Inc. 2008

[3] Union Pacific railroad corridor 24-hour noise level measurements were conducted in February 2008 and the Burlington Northern Santa Fe railroad corridor 24-hour noise level measurements were conducted in March 2008.

Figure N - 2

Union Pacific Railroad Corridor Noise Level Contours



Existing and future noise sensitive land use development within 2,100 feet of the UPRR main rail corridor or within 1,300 feet of the BNSF main rail corridor could be exposed to unacceptable noise levels associated with passing freight or passenger trains. Appropriate site planning and design, barriers and buffers, building materials, or other effective measures will be necessary to achieve required interior and exterior noise level standards.

The California High Speed Train planned for the San Joaquin Valley may travel near the City. This facility will not have any grade crossing where horns will be sounded. The train will be powered by electric motors taking current from the grid. According to preliminary environmental documentation, for the High Speed Train, the noise level generated by these trains will be very low.

CHOWCHILLA AIRPORT

The Chowchilla Municipal Airport, a general aviation facility, is the only air facility located within the Planning Area, but there are other aviation activities in the Planning Area and Sphere of Influence that can influence land uses within the Planning Area.

The Chowchilla Municipal Airport is located approximately southeast of the center of the City of Chowchilla. The Airport parallels the UPRR main rail corridor and is adjacent to the Chowchilla Fairgrounds. The Chowchilla Municipal Airport is open 24 hours per day and has a lighted runway for night operations. Under normal weather conditions, the airport departure pattern is to the northwest over a portion of the City's downtown commercial and residential neighborhoods and the airport approach pattern is from the south. On an annual average basis, there are approximately 229 aircraft operations per day with the majority of aircraft using the southeast approach (Runway 30).

Airport noise exposure contours for the Chowchilla Municipal Airport were developed by the Madera County Airport Land Use Commission using cumulative noise levels quantified in terms of community noise equivalent levels (CNEL) based on airport projected in the Year 2011. The 2011 annual CNEL contours for the Chowchilla Municipal Airport are illustrated in Figure N - 3 depicts the 60 and 65 CNEL contours for the Year 2011.

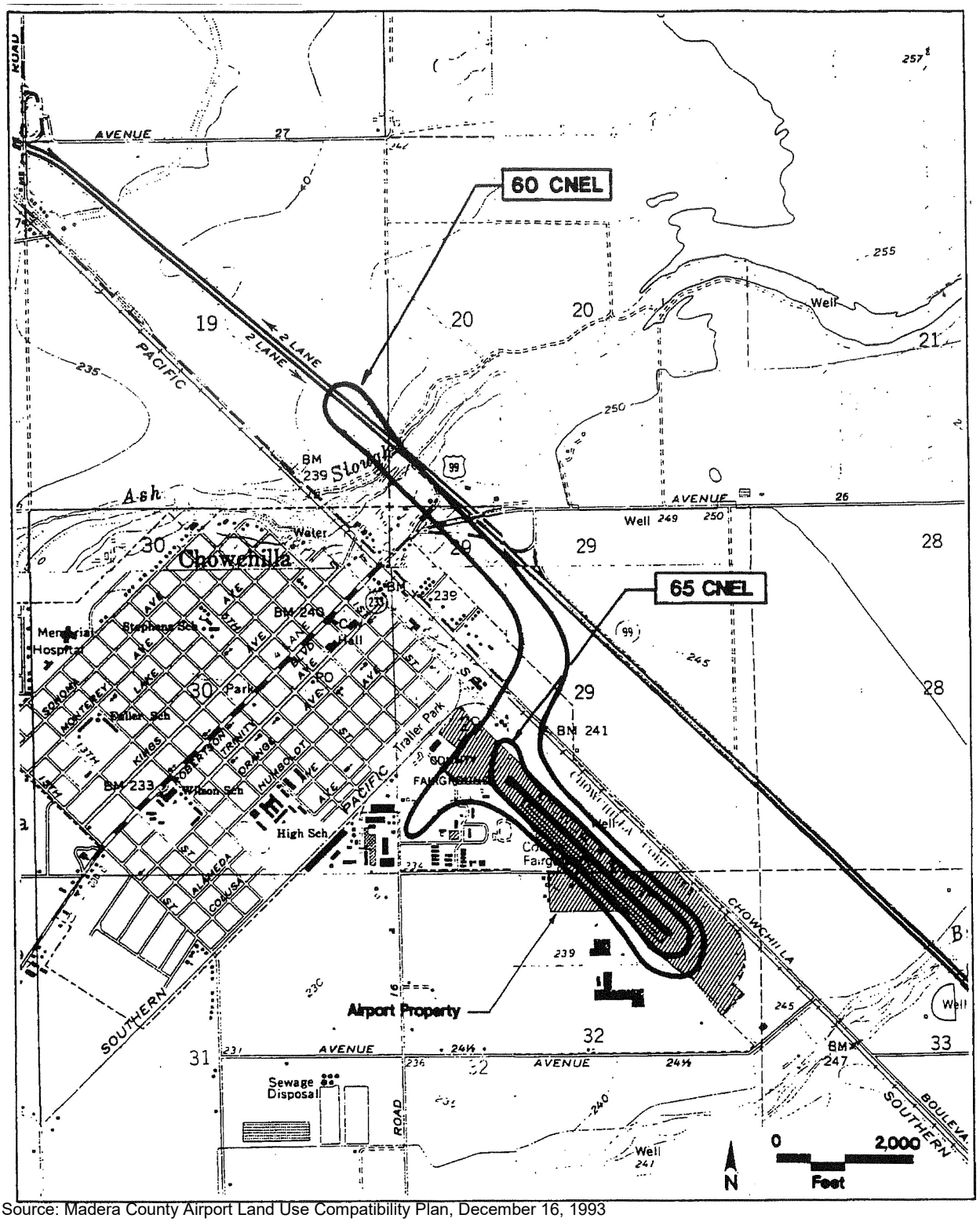
The Chowchilla District Memorial Hospital allows for emergency helicopter airlift services. The Hospital's emergency helicopter airlift services operate on an as needed basis 24 hours a day. Agriculture aviation services (i.e., aerial spraying) are utilized to service the unincorporated areas within the Planning Area and Sphere of Influence.

STATIONARY NOISE SOURCES

Noise is inherent in many industrial, commercial, recreation and entertainment practices as well as in public works facility operations, even when the best available acoustical technology available is applied. Thus Industrial, commercial, recreational and public service facility activities can produce noise which can affect adjacent sensitive land uses. Stationary noise sources include, but are not limited to, processing facilities,

Figure N - 3

Chowchilla Municipal Airport Noise Level Contours



Source: Madera County Airport Land Use Compatibility Plan, December 16, 1993

pump stations, industrial facilities, trucking operations, tire shops, automobile maintenance shops, metal fabrication, shops, shopping centers, drive-up window services, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, gravel product operations, special events such as concerts and sports. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. Noise generated from fixed noise sources may vary based upon climatic conditions, time of day and existing ambient noise levels.

Agriculture

A variety of agriculture operations are present in and around the Planning Area and Sphere of Influence. Noise sensitive land uses adjacent to or in the vicinity of agriculture can be affected by agricultural operations. Due to the wide array of equipment types and conditions under which equipment is used in the agriculture industry, noise generated by agricultural processes and operations varies substantially. Agricultural field crops and orchards are subjective to ground or aerial spraying. Noise from aerial or ground spraying equipment and activities vary depending on the type of aircraft or aerial applicator utilized.

Industrial Business

The industrial business have a varying degree of noise sources depending on the type and use of mechanical equipment, generators, and vehicles utilized at the facility and whether or not the operations involve outdoor activities. Noise exposures within industrial facilities are controlled by state and federal employee health and safety regulations - California Division of Occupational Safety and Health (Cal / OSHA) and United States Occupational Safety and Health Administration (OSHA), respectively. Noise levels outside industrial facilities are regulated by local standards and ordinances.

Existing stationary industrial noise sources primarily exist in the southerly portion of the Planning Area designated Heavy Industrial. Existing sources of industrial noise include: Certainteed; Central Valley Concrete; California Corn Growers; Almond Tree Hulling Company; Piranha Pipe-Precast; and North American Energy Systems.

Chowchilla Madera County Fairgrounds

The Chowchilla Madera County Fairgrounds is located on South 3rd Street adjacent to the Chowchilla Municipal Airport. There are a variety of noise sources associated with the fairground operations including, but not limited to, parking, amplified speech and music, amusement / carnival rides, livestock, concerts, and racing. The majority of these activities are limited to four days of operation during the Chowchilla Madera County Fair which is usually held annually in May.

A nightly concert series is hosted during annual Chowchilla Madera County Fair. Performances are held on an outdoor theater in the northwestern portion of the fairgrounds. Noise levels associated with concerts and musical events can vary

considerably depending on several factors: crowd size, type of music, operational levels of the sound system and the duration of the event.

Off-season use of the fairgrounds is generally associated with private facilities rentals, and the Chowchilla Speedway. The Chowchilla Speedway is a 1/3 mile oval clay race track located on the eastern portion of the Chowchilla Madera County fairgrounds. Racing series' range from sanctioned modifieds to sport compacts. Racing events occur Saturdays evening from March through October. Monthly test and tune are scheduled on Sunday mornings during the racing season.

NOISE / LAND USE COMPATIBILITY

Noise performance criteria have been established to guard against exposure of residential and other noise – sensitive uses to loud industrial – related noise and to prevent encroachment of noise sensitive uses upon existing noise producing facilities. Residential uses are particularly sensitive because individuals and families expect to use time in the home for rest and relaxation. While some variability in standards for noise sensitivity apply to different type and densities of residential development specifically with infill and mixed use development, single family uses are frequently considered the most sensitive of residential type development. Land uses also deemed sensitive include hospitals, convalescent and childcare facilities, schools, amphitheaters, concert halls, auditoriums and meeting halls.

Agricultural, industrial and commercial areas are considered to be the least sensitive land uses. Therefore, sensitive noise receptors must be protected from excessive noise associated with commercial and industrial business and agricultural activities. New and redevelopment projects should only be undertaken when it can be demonstrated that noise reduction requirements can be employed to reduce noise affects to an acceptable level.

A maximum exterior noise level of 60 dBA CNEL or L_{dn} is considered "normally acceptable" for unshielded noise sensitive land uses (i.e., residential, schools, hospitals, convalescent, childcare.). Normally acceptable means that no noise evaluation is needed and any buildings may be constructed use conventional techniques. Exterior noise levels between 60 and 70 dBA CNEL or L_{dn} fall within the "conditionally unacceptable" range and those in the 70 to 75 dB range are considered "normally unacceptable".

The thresholds for speech interference indoors are 45 dBA if noise is steady and above 55 dBA if noise fluctuating. Outdoors, the thresholds are about 15 dBA higher. Steady noise of sufficient intensity (above 35 dBA) and fluctuating noise levels above 45 dBA have been shown to affect sleep. Interior residential standards for multiple family dwellings are set by the State of California at 45 dBA CNEL. This standard is designed for sleep and speech protection.

The compatibility criteria provided in Table N - 5 aids in defining and assessing land use capabilities with respect to transportation (i.e., roadway traffic, aircraft operations, and

to a lesser extent – railroad operations) noise levels and tolerances. Table N - 5 defines noise in terms of CNEL and expressed in dBA that measure sound intensity. Noise levels occurring nighttime hours are weighted more heavily than during the daytime.

Table N - 5

Transportation Noise / Land Use Compatibility Guidelines for Exterior Noise Levels

Land Use	Exterior Noise Exposure (dBA CNEL)			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Single Family Home, Duplex, Triplex, Mobile Home	≤ 60	60 - 65	65 - 70	> 70
Fourplex, Apartment, Condonimum, Townhome	≤ 60	60 - 70	70 - 75	> 75
Mixed Use, Infill Residential	≤ 65	65 - 75	75 - 80	> 80
Commercial – Motel, Hotel, Transient Lodging	≤ 65	65 - 75	75 - 80	> 80
School, Library, Church, Hospital, Nursing Home	≤ 60	60 - 70	70 - 80	> 80
Auditorium, Concert Hall, Amphitheater		≤ 65		> 65
Sports Arena, Outdoor Spectator Sport		≤ 70		> 70
Playgrounds, Park	≤ 70	70 - 75		> 75
Golf Course, Water Recreation, Cemetery	≤ 70		70 - 80	> 80
Office Building, Business, Commercial, Retail	≤ 65	65 - 75	> 75	
Freeway Adjacent Commercial, Office and Industrial Uses	≤ 65	65 - 80	> 80	
Industrial, Manufacturing, Utility, Agriculture	≤ 70	70 - 80	> 80	

Notes:

[1]**Normally Acceptable =** Specific land use is satisfactory, based on the assumption that any building is of normal conventional construction, without any special noise insulation requirements.

[2]**Conditionally Acceptable =** New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

[3]**Normally Unacceptable =** New construction or development should be generally discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

[4]**Clearly Unacceptable =** New construction or development is not to be undertaken, unless it can be demonstrated that noise reduction requirements can be employed to reduce noise impacts to an acceptable level. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

Similar to Table N - 5 above, the data provided in Table N - 6, below aids in defining and assessing land use compatibilities with respect to on-site industrial or commercial noise sources (i.e., air compressors, loading docks, cooling towers, mechanical equipment). Table N - 6 defines noise in terms of exterior hourly noise level performance (L_{eq} / L_{50}) and expressed in dBA that measure sound intensity. The hourly L_{eq} / L_{50} noise level criterion is found to provide a good correlation to noise sources that operate for a relatively short duration.

Table N - 6

Stationary Noise / Land Use Compatibility Guidelines for Exterior Noise Levels

Land Use	Exterior Noise Exposure (dBA L_{eq} / L_{50})					
	Normally Acceptable[1]		Conditionally Acceptable[2]		Unacceptable[3]	
	Daytime (10 pm - 7 am)	Nighttime (10 pm - 7 am)	Daytime (10 pm - 7 am)	Nighttime (10 pm - 7 am)	Daytime (10 pm - 7 am)	Nighttime (10 pm - 7 am)
Single Family Home, Duplex, Triplex, Mobile Home	≤ 55	≤ 45	55 - 60	45 - 50	> 60	> 50
Fourplex, Apartment, Condonimum, Townhome	≤ 55	≤ 50	55 - 65	50 - 55	> 65	> 55
Mixed Use, Infill Residential	≤ 60	≤ 50	60 - 70	50 - 60	> 70	> 60
Commercial – Motel, Hotel, Transient Lodging	≤ 65	≤ 50	65 - 70	50 - 60	> 70	> 60
School, Library, Church, Hospital, Nursing Home	≤ 60	≤ 50	60 - 65	50 - 55	> 60	> 55
Auditorium, Concert Hall, Amphitheater			≤ 65	≤ 60		
Sports Arena, Outdoor Spectator Sport			≤ 75	≤ 70		
Playgrounds, Park	≤ 65	≤ 50	65 - 70	≤ 60		
Golf Course, Water Recreation, Cemetery	≤ 55	≤ 50	55 - 60	50 - 55	> 60	> 55
Office Building, Business, Commercial, Retail	≤ 65	≤ 55	65 - 70	55 - 60	> 70	> 60
Freeway Adjacent Commercial, Office and Industrial Uses	≤ 65	≤ 60	65 - 70	60 - 65	> 70	> 65
Industrial, Manufacturing, Utility, Agriculture	≤ 65	≤ 60	65 - 70	60 - 65	> 70	> 65

Notes:

[1]**Normally Acceptable =** Specific land use is satisfactory, based on the assumption that any building is of normal conventional construction, without any special noise insulation requirements.

[2]**Conditionally Acceptable =** New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice. With the exception of industrial, manufacturing, utility and agricultural uses, the analysis shall identify attenuation required to maintain an indoor level of ≤ 45 dBA.

[3]**Unacceptable =** New construction or development should not be undertaken, unless it can be demonstrated that noise reduction requirements can be employed to reduce noise impacts to an acceptable level. With the exception of industrial, manufacturing, utility and agricultural uses, the Analysis shall identify attenuation required to maintain an indoor level of ≤ 45 dBA.

The land use compatibility guidelines for exterior noise levels identified in Table N - 5 and Table N - 6 recognize and respond to the many different ambient noise environment settings in the Planning Area – relative quiet environment typical of suburban neighborhoods as well as the higher activity areas such as the City's Downtown and designated Mixed Use Areas. The City supports new residential development within already urbanized areas where ambient noise levels may be higher

than those experienced in neighborhoods located on the urban periphery in an effort to promote higher densities and mixed use developments.

One of the goals of the Chowchilla 2040 General Plan is to minimize the exposure and affects associated with noise producing sources including transportation facilities and stationary sources. One of the primary principles incorporated into this General Plan and reflected in Figure LU-1, 2040 General Plan Land Use Diagram, is the use of compatible land use practices. Noise generating land uses, such “Heavy Industrial” designated areas should and are placed in locations adjacent to compatible land uses and of sufficient distance from designated sensitive land use noise receptors (i.e., residences, schools).

The Chowchilla 2040 General Plan also aims to reduce or minimize exposure transportation related noise sources. Site planning, and the design and construction of noise barriers are the most common and effective methods of alleviating vehicular traffic and railroad operational noise levels. The effectiveness of noise barriers depend on the relative height and materials of the barrier, the noise source, the affected area, and the horizontal distance between the barrier and the affected area. Setbacks and buffers can also be used to achieve noise reduction. Barriers and buildings which block the line-of-sight between a source and a receptor will attenuate the noise source. If a receptor is located behind the barrier, has a view of the source, the barrier will do little to attenuate the noise.

NOISE GOALS, OBJECTIVES, POLICIES, AND IMPLEMENTATION MEASURES

Goals

- **Protect the City of Chowchilla from the harmful and annoying effects of exposure to excessive noise.**

- **Protect the economic base of the City of Chowchilla by preventing incompatible land uses from encroachment upon existing or planned noise producing land uses.**

Objectives, Policies and Implementation Measures

The following objectives, policies and programs are organized into the categories and sequence outlined above. The categories, in the order they are presented, are roadway and railroad corridors, aviation, and stationary noise sources and land use compatibility.

Objective N 1

Minimize noise levels from point sources throughout the City and, wherever possible, mitigate the effects of noise to provide a safe and healthful environment.

Policy N 1.1

Continue to enforce noise abatement and control measures particularly within residential neighborhoods.

Implementation Measure N 1.1. A

The Chowchilla Police Department shall actively enforce the California Vehicle Code sections relating to adequate vehicle mufflers and modified exhaust systems. Exceptions may be made for special events conducted in the City.

Policy N 1.2

Require the inclusion of noise reducing design features in development consistent with standards in Table N - 5, Table N - 6, and Title 24 California Code of Regulations.

Implementation Measure N 1.2. A

The City shall utilize procedures for project review and issuance of building permits to ensure that noise mitigation measures identified in an acoustical analysis are implemented in the project design.

Policy N 1.3

Incorporate noise considerations into the site plan review process particularly with regard to parking and loading areas, ingress / egress points and refuse collection areas.

Policy N 1.4

The City of Chowchilla shall prohibit the development of new commercial, industrial or other noise generating land use adjacent to existing residential uses, or other sensitive noise receptors such as schools, healthcare facilities, libraries and churches if noise levels are expected to exceed 65 dBA L_{dn} measured at the property line of the noise sensitive land use.

Policy N 1.5

Review development proposals with respect to the Land Use Compatibility Guidelines for Exterior Noise in Table N - 5 and Table N - 6 as follows:

a) **Normally Acceptable:** If the noise level is within the “normally acceptable” level, noise exposure would be acceptable for the intended land use. Development many occur without requiring an evaluation of the noise environment unless the use could generate noise impacts on adjacent uses.

b) **Conditionally Acceptable:** If noise level is within the “conditionally acceptable” level, noise exposure would be acceptable; a specified land use may be permitted only after detailed analysis of the noise environment and the project characteristics to determine whether noise insulation or protection features are required. Such noise insulation features may include

measures to protect noise sensitive outdoor activity areas (i.e., residences, schools, parks) or may include building sound insulation treatments such as sound-rated windows to protect interior spaces in sensitive receptors.

c) **Normally Unacceptable:** If the noise level is within the "normally unacceptable" level, analysis and mitigation are required. Development should generally not be undertaken unless adequate noise mitigation options have been analyzed and appropriate mitigation incorporated into the project to reduce the exposure of people to unacceptable noise levels.

d) **Clearly Unacceptable:** If the noise level is within the "clearly unacceptable" level, new construction or development should not be undertaken unless all feasible noise mitigation options have been analyzed and appropriate mitigations incorporated into the project to adequately reduce exposure of people to unacceptable noise levels.

Policy N 1.6

The City of Chowchilla shall allow the development of noise sensitive land uses (which include, but are not limited to, residential neighborhoods, schools, and hospitals) only in areas where existing or projected noise levels are acceptable according to Table N - 5 and Table N - 6. Noise mitigation measures may be required to reduce noise in outdoor activity areas and interior spaces to achieve these levels.

Policy N 1.7

The City of Chowchilla shall require noise analysis for new noise sensitive development in areas subject to noise levels greater than 65 dBA CNEL as part of the environmental review process and to require mitigation measures to reduce noise impacts to acceptable levels. The acoustical analysis shall be the responsibility of the project applicant and be prepared by a qualified person experienced in the fields of environmental noise assessments. The acoustical analysis shall address affects of the project based on existing conditions and build-out conditions of the Chowchilla 2040 General Plan. (See Policy N 4.1).

Implementation Measure N 1.7. A

In making a determination of impact under the California Environmental Quality Act (CEQA), consider an increase of four (4) or more decibels to be "significant" if the resulting noise level would exceed that described as normally acceptable for the affected land use in Table N - 5 and in Table N - 6 as applicable.

Policy N 1.8

The City of Chowchilla shall establish an ongoing noise monitoring program to enforce City noise standards.

Policy N 1.9

Evaluate and, if warranted, mitigate noise impacts from roadway improvement projects at the time of project design.

Policy N 1.10

Continue to consider noise concerns in evaluating all proposed development decisions where residential uses could be impacted by commercial, industrial, and roadway projects.

Policy N 1.11

The City of Chowchilla shall maintain a pattern of land uses that separates noise sensitive land uses from major noise sources to the extent possible.

Policy N 1.12

The City shall require monitoring of compliance with the standards of the Noise Element after completion of projects where noise mitigation measures have been required.

Policy N 1.13

The City shall require all development projects to mitigate noise impacts associated with construction activities.

Objective N 2

Minimize the adverse effects of airport related noise through proper land use planning.

Policy N 2.1

Ensure that new development can be made compatible with the noise environment by using the standards in, and airport noise contours identified in Figure N - 3, as guides to future planning and development decisions.

Policy N 2.2

Avoid placing noise sensitive land uses (e.g., residences, schools, group homes, assisted living facilities, day care centers, etc.) within high noise impact areas (greater than 65 dB CNEL) associated with the Chowchilla Municipal Airport.

Policy N 2.3

The City of Chowchilla shall coordinate with Madera County Airport Land Use Commission in maintaining the noise contours for the Chowchilla Municipal Airport as notable changes in current or projected operations are planned. All new land use proposals shall comply with the land use policies of the Airport Land Use Compatibility Plan for Madera County Airports (MCALUCP) for aircraft-generated community noise.

Implementation Measure N 2.3. A

All residential development within the area included in the MCALUCP shall be restricted to areas where outdoor noise levels are less 65 dB CNEL and shall be prohibited in those areas which are greater than 65 dB CNEL except those areas that were designated for residential development prior to the adoption of the General Plan Noise Standards. In those areas, residential uses may be permitted within the 65 to 70 dBA CNEL Noise Contour, if the City Council makes findings that the use was intended prior to the adoption of the General Plan Noise Standards, that substantial resources have been allocated to the planning or construction of that use, that alternative locations for such use are limited or not reasonably available, and that notification to the property owner and future tenants will be given in a legally acceptable manner that significant noise may be present at that location.

Policy N 2.4

Utilize the Airport Protection Overlay Zone, as appropriate, in review of development projects in the vicinity of Chowchilla Municipal Airport.

Objective N 3

Minimize ground transportation related noise impacts through proper land use planning.

Policy N 3.1

Ensure that noise impacts generated by vehicular sources are minimized through the use of noise reduction features (e.g., earthern berms, buffers, landscaped walls, etc.)

Policy N 3.2

Investigate and pursue innovative approaches to reducing noise railroad sources.

Policy N 3.3

Identify and aggressively pursue funding sources to provide grade separations and sound walls along the Union Pacific Railroad Company mainline corridor as noise attenuation measures.

Policy N 3.4

Prioritize locations for implementing road / rail grading separations.

Policy N 3.5

The City of Chowchilla shall work with Caltrans to mitigate noise impacts on sensitive receptors near Highways 99, 156 and 233, and other key state roadways by requiring noise buffering or insulation in new construction.

Policy N 3.6

The City of Chowchilla shall control noise sources in residential areas and other noise sensitive areas by restricting truck traffic to designated truck routes.

Policy N 3.7

The circulation system shall be designed to minimize excessive noise impacts on sensitive land uses. New development shall mitigate noise impacts in accordance with the requirements of the noise element.

Implementation Measure N 3.7. A

Future development and redevelopment along major transportation corridors shall be required to demonstrate that the project will not be subjected to unacceptable noise levels at full road design capacity.

Policy N 3.8

The City of Chowchilla shall seek to reduce impacts from ground borne vibrations associated with rail operations by requiring the habitable buildings are sited at least 100-feet from the centerline of the tracks. An interior noise level of up to 45 dBA, with windows closed, shall not be exceeded.

Implementation Measure N 3.8. A

For habitable buildings located within 100 feet from the centerline of railroad tracks, development shall provide a study demonstrating that ground borne vibration issues associated with rail operations have been adequately addressed (i.e., by building orientation or construction techniques). This study must demonstrate that an interior noise level of up to 45 dBA will not be exceeded with windows closed.

Policy N 3.9

The City of Chowchilla shall require noise buffering or construction treatments (i.e., insulation) in new development that includes noise sensitive uses located near major streets, highways, railroad corridors, Chowchilla Municipal Airport or significant sources of noise.

Policy N 3.10

Provide for spatial separation and necessary noise barriers between railroads and residential or other noise sensitive uses.

Implementation Measure N 3.10. A

Future development along the Union Pacific Railroad Company mainline corridor and the Chowchilla Airport should be buffered with open space and / or noise barriers.

Objective N 4

Establish appropriate noise levels, design standards, and noise reduction techniques for all areas to minimize the adverse effects of noise.

Policy N 4.1

The City of Chowchilla shall use the Land Use Compatibility Guidelines for Exterior Noise (measured in dBA CNEL or L_{dn}) contained in Table N - 5 and Table N - 6 in this Element, as applicable, to direct the siting, design, and insulation of new development to reduce exposure to excessive noise. Where warranted, the City shall employ discretionary review of new development to ensure that the community will be protected from excessive noise levels. The City shall evaluate potential noise impacts and recommend mitigation measures through discretionary review procedures such as environmental reviews, design review and evaluation of use permits.

Implementation Measure N 4.1. A

Non-transportation noise: Noise created by non-transportation noise sources shall be mitigated so as not to exceed the exterior noise level standards of Table N - 6. Where proposed non-transportation noise sources are likely to produce noise levels exceeding the performance standards on Table N - 6, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design.

Implementation Measure N 4.1. B

Non-transportation noise: New development of noise sensitive land uses shall not be allowed where the noise level due to non-transportation noise sources will exceed the standards of Table N - 6. Where noise sensitive land uses are proposed in areas exposed to existing or projected exterior non-transportation noise levels exceeding the performance standards of Table N - 6, an acoustical analysis shall be required so that noise mitigation may be included in the project design at the cost of the developer.

All acoustical analyses required shall:

1. *Be the responsibility of the applicant.*
2. *Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.*
3. *Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.*
4. *Estimate existing and projected (20 year) noise levels in terms of L_{dn} and / or the standards of Table N - 6, and compare those levels to the policies of this Element.*
5. *Recommend appropriate mitigation to achieve compliance with the*

adopted policies and standards of this Element. Where the noise source in question consists of intermittent single events, the report must address the effects of maximum noise levels in sleeping rooms in terms of possible sleep disturbance.

6. *Estimate noise exposure after the prescribed mitigation measures have been implemented.*
7. *Describe a post-project assessment program which could be used to evaluate the effectiveness of the proposed mitigation measures.*

Policy N 4.2

The City shall require that industrial and commercial uses be designed and operated so as to avoid generation of noise effects on surrounding sensitive land uses.

Policy N 4.3

The City of Chowchilla shall grant exceptions to the noise standards for commercial or industrial uses only if a recorded noise easement is conveyed by the affected property owners.

Implementation Measure N 4.3. A

Project applicants for project developments in areas identified as either conditionally unacceptable range or normally unacceptable shall prepare an acoustical analysis and, if necessary, identify possible mitigation measures to reduce the effects to noise levels to acceptable levels.

Policy N 4.4

In an effort to support active uses in the Downtown Area, the Downtown Area shall be subject to a different noise standard than other locations within the City, as follows:

- Downtown Commercial Designation: Between 7:00 am and 12:00 am, exterior noise levels of up to 75 dBA would be considered “normally acceptable” for all uses; and between 12:00 am and 7:00 am, exterior noise levels of up to 65 dBA would be considered “normally acceptable” for all uses.

- West Robertson Boulevard Service Commercial Designation: Between 7:00 am and 12:00 am, exterior noise levels up to 70 dBA would be considered ‘normally acceptable” for all uses; and between 12:00 am and 7:00 am, exterior noise level up to 60 dBA would be considered “normally acceptable”.

- For all residential development in the Downtown Area, the interior noise level shall not exceed 45 dBA with windows closed would be considered “normally acceptable”.

Policy N 4.5

During all phases of construction, the City of Chowchilla shall take measures to minimize the exposure of neighboring properties to excessive noise levels from construction related activity.

Policy N 4.6

The City of Chowchilla shall limit construction activities to the hours of 7:00 am to 7:00 pm, Monday through Saturday. No construction shall occur on Sundays or national holidays without a permit from the City.

Implementation Measure N 4.6. A

For all temporary construction, demolition or maintenance noise and other necessary short-term noise events, the stationary noise standards in Policy N 4.1, above may be exceeded within the receiving land use by:

1. *5 dBA for a cumulative period of no more than fifteen (15) minutes in any hour.*
2. *10 dBA for a cumulative period of no more than five (5) minutes in any hour.*
3. *15 dBA for a cumulative period of no more than one (1) minute in any given hour.*
4. *In order to allow for temporary construction, demolition or maintenance noise and other necessary short-term noise events, the stationary noise standards in Policy N 4.1 above, shall not be exceeded within the receiving land use by more than 15 dBA any period of time.*

Policy N 4.7

The following sources of noise are exempt from the standards in Policy N 4.1: motor vehicles on public streets; trains; emergency equipment, vehicles, devices and activities; temporary construction, maintenance, or demolition activities conducted between the hours of 7:00 am and 7:00 pm.

Objective N 5

Adopt design standards and identify effective noise attenuation programs to prevent noise or reduce noise to acceptable levels.

Policy N 5.1

When crafting mitigation programs for adverse noise exposure from new development, the City of Chowchilla shall encourage the use of noise attenuation programs that avoid constructing sound walls.

Policy N 5.2

The City of Chowchilla shall require the control of noise at the source for new development deemed to be noise generators through site design, building design, landscaping, hours of operation and other techniques.

Policy N 5.3

The City of Chowchilla shall require operational limitations and feasible noise buffering for new uses that generate significant noise impacts near sensitive uses.

Policy N 5.4

The City of Chowchilla shall require mitigation measures to minimize noise impacts on surrounding areas as part of the permit review process for land uses of a temporary nature, such as fairs or exhibits. The noise level from the temporary use should be in conformance with noise level guidelines for nearby land uses.

Implementation Measure N 5.4. A

Promote use of noise insulation materials in new construction and major rehabilitation.

Implementation Measure N 5.4. B

Identify noise attenuation programs for mitigation of noise adjacent to existing residential areas, including such measures as wider setbacks, intense landscaping, and building orientation away from the noise source.

Objective N 6

Reduce noise levels from traffic.

Policy N 6.1

The City of Chowchilla shall minimize potential transportation noise through proper design of street circulation, coordination of routing, and other traffic control measures.

Policy N 6.2

The City shall provide planned industrial areas with truck access routes separated from residential areas to the maximum feasible extent.

Policy N 6.3

The City of Chowchilla shall require exterior noise in backyards to be “normally acceptable” at a maximum of 60 dBA CNEL for single family and multi-family development.

Policy N 6.4

The City of Chowchilla shall consider soundwalls as a means of noise mitigation along proposed and existing roadway segments and railroad corridors only after other noise

attenuation programs such as building orientation, setback distances, landscaped berms have been considered to reduce noise to appropriate levels in residential areas.

Policy N 6.5

The City of Chowchilla shall discourage the use of un-landscaped sound walls. Developers / builders are required to provide for landscaping sound walls as part of the normal improvement requirements.

Implementation Measure N 6.5. A

The construction of sound walls will be considered where noise mitigation to acceptable levels by other means is not feasible.

Objective N 7

Protect the residents of Chowchilla from the harmful and annoying effect of excessive noise and protect the City's economic base by preventing incompatible land uses from encroaching upon existing or planned noise-producing uses.

Policy N 7.1

The City shall purchase only equipment and vehicles which comply with noise level performance standards based upon the best available noise reduction technology.

Policy N 7.2

The City shall enforce the State Noise Insulation Standards (California Code of Regulations, Title 24) and Chapter 35 of the UBC.

Policy N 7.3

The City may adopt and enforce nuisance noise abatement ordinances limiting the noise level and time of the day which such noises may be allowed.