4.9 NOISE

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

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals of pressure), as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers is a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in decibel levels correspond closely to human perception of relative loudness. **Figure 4.9-1** illustrates common noise levels associated with various sources.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighing network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this evaluation are in terms of A-weighted levels.

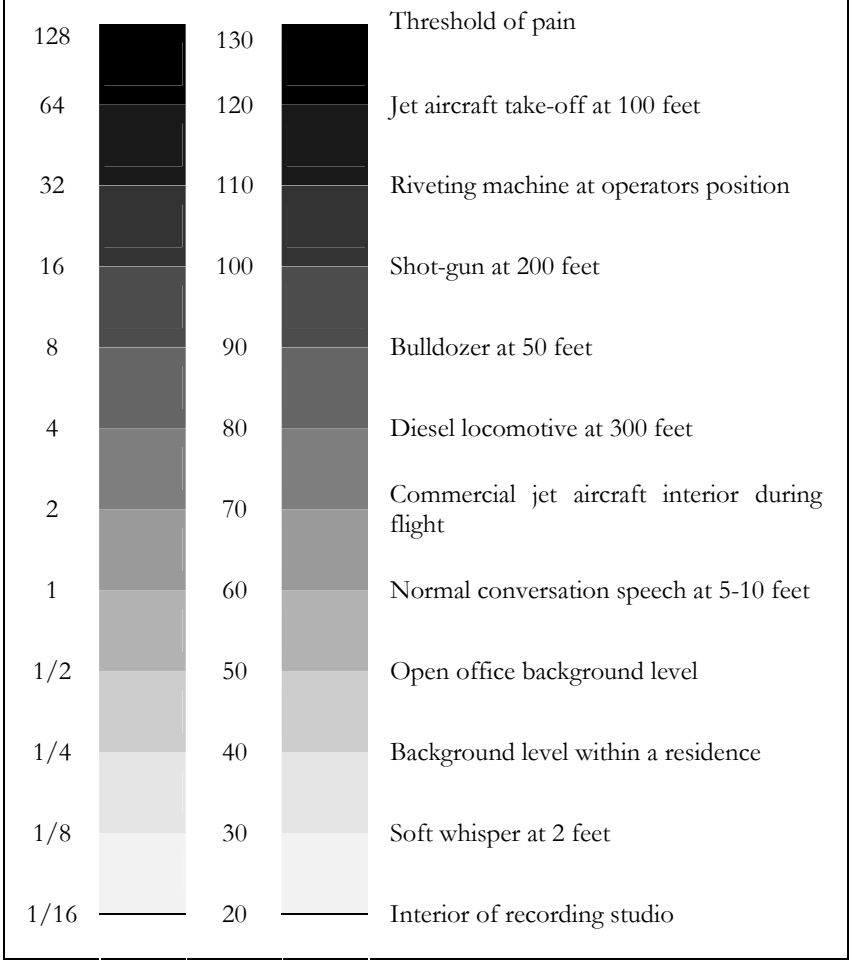
Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (Leq), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time-varying signal over a given time period (usually one hour). The Leq is the foundation of the composite noise descriptor, Ldn, and shows very good correlation with community response to noise. The Day-night Average Level (Ldn) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because Ldn represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

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

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

FIGURE 4.9-1

TYPICAL A-WEIGHTED SOUND LEVELS OF COMMON NOISE SOURCES



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

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

4.9.1 AFFECTED ENVIRONMENT/ENVIRONMENTAL SETTING – ALTERNATIVES 1 AND 2

Existing Noise Environment in the Project Vicinity

The ambient noise environment in the immediate project vicinity is described as being fairly quiet, with the quiet interrupted by intermittent aircraft operations from the Redding Municipal Airport and local vehicle passages. Except for the airport and local surface traffic, no major noise sources were identified in the immediate project vicinity during the Bollard & Brennan, Inc. field inspection. Therefore, this assessment of existing ambient conditions in the project vicinity focuses on noise from aircraft and local traffic.

To generally quantify the existing ambient noise environment in the project vicinity, short-term (30 minute) ambient noise level measurement surveys were conducted at 6 locations on July 12, 2000. Those noise measurement locations and results are shown in **Table 4.9-2**.

Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters were used for the noise level measurement survey. The meters were calibrated before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

The ambient noise monitoring survey revealed that ambient noise levels in the immediate project vicinity are very low, punctuated by intermittent aircraft departures and vehicle passages on local roadways.

TABLE 4.9-2

AMBIENT NOISE MONITORING RESULTS
ALTERNATIVES 1 AND 2 VICINITY – JULY 12, 2000

Site	Location	Time	Maximum (Lax)	Average (Leq)	Median (L50)	Background (L90)	Noise Sources
1	Northwest Site Corner	09:40 AM	69	50	41	37	Very quiet. Some small aircraft overflights.
2	Middle of Site	10:20 AM	78	55	35	29	Very quiet. Some small aircraft overflights.
3	Northeast Site Corner	10:40 AM	68	49	33	25	Very quiet. Some small aircraft overflights.
4	Eastern P/L by House	11:02 AM	70	53	40	28	Very quiet. Some small aircraft overflights.
5	Southwest Site Corner by Airport	12:50 PM	77	50	48	41	Twin engine aircraft departure

Source: Bollard & Brennan, Inc. Noise measurement locations are shown on Figure 1.

The short-term ambient noise level data reported in **Table 4.9-1** reflects a fairly quiet background noise environment. This is typical of rural areas affected by intermittent traffic and aircraft noise. Because the short-term ambient noise survey was conducted during daytime hours, it does not describe ambient noise conditions during nighttime hours.

To quantify the nighttime noise environment in the immediate project vicinity, continuous noise monitoring was conducted between 9 a.m. on July 12 and 7 a.m. on July 13, 2000. The continuous noise measurement location, which is shown on Figure 1, was positioned in the north-central portion of the project site, at the juncture of industrial lots 1, 2, and 4. The results of the continuous noise measurements are shown in **Figure 4.9-3**. The **Figure 4.9-3** data confirm that nighttime background noise levels are fairly low, and that there were no significant aircraft noise events between the hours of Midnight and 5 a.m.

Existing Traffic Noise Environment in Project Vicinity

The Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-77-108) with the Calveno vehicle noise emission curves was used to quantify existing traffic noise levels in the general Project site vicinity. The FHWA Model is the traffic noise prediction model currently preferred by the Federal Highway Administration, the State of California Department of Transportation (Caltrans), and most city and county governments, for use in traffic noise assessment. Although the FHWA Model is in the process of being updated by a more sophisticated traffic noise prediction model, the use of RD-77-108 is still considered acceptable.

Existing traffic conditions on the roadways to be utilized by the Project have been evaluated by Omni-Means, Engineers and Planners. The FHWA Model was used with that information, and traffic data obtained from published Caltrans traffic counts and Bollard & Brennan, Inc. field surveys to develop distances to existing Ldn contours for the major project area roadways. The FHWA Model input data for those roadways is provided in Table 2. The distances from the centerlines of the major roadways to the 60 and 65 dB Ldn contours are also summarized in **Table 4.9-3**.

Existing Aircraft Noise Environment in the Project Vicinity

The Redding Municipal Airport is located immediately southwest of the Alternative 1 and 2 site. The City of Redding General Plan Noise Element reports that, in 1993-94 there were approximately 113,000 total aircraft operations, or about 35 per day. Existing noise conditions for the airport were identified in the *Redding Municipal Airport Master Plan Report Update,* conducted in August of 1995. The existing noise generation of the airport is represented in the form of noise exposure contours. Those contours are shown in Figure 5-3 of the Redding Noise Element, and are incorporated into this document by reference. According to the Noise Element, the 60 dB CNEL noise contours for the airport do not currently encroach onto existing residential uses.

The ambient noise survey conducted by Bollard & Brennan for Alternative 1 indicates that short-term increases in ambient noise levels at the project site are common during aircraft departures or overflights. However, the maximum noise generation of those overflights was not of sufficient magnitude to interfere with future industrial operations on the project site or to pose a health threat to persons working on the Alternative 1 or 2 site.

TABLE 4.9-3

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL DATA INPUTS AND DISTANCES TO 60 AND 65 DB LDN CONTOURS ALTERNATIVES 1 AND 2 ROADWAYS - EXISTING CONDITIONS

						Truck Usage			Dist. to Ldn Contours, feet	
Roadway Name	**From**		**ADT**	**Day %**	**Night %**	**Med.**	**Hwy.**	**Speed**	**65 dB Ldn**	**60 dB Ldn**
Airport Road	S.R. 44	Hartnell Avenue	11,400	87	13	2	5	50	112	241
Airport Road	Hartnell Avenue	Rancho Road	10,500	87	13	2	5	50	106	228
Airport Road	Rancho Road	Knighton Road Extension	11,000	87	13	2	5	50	109	235
Airport Road	Knighton Rd Extension	Fig Tree Lane	10,500	87	13	2	5	50	106	228
Airport Road	Fig Tree Lane	Riverside Avenue	9,000	87	13	2	5	50	96	206
Old Oregon Trail	Airport Road	Rancho Road	700	87	13	2	5	50	17	38
Hartnell Avenue	Argyle Road	Airport Road	3,000	87	13	2	5	50	46	99
Argyle Road	Hartnell Avenue	Airport Road	2,500	87	13	2	5	50	41	88
Rancho Road	Churn Creek Road	Airport Road	4,200	87	13	2	5	50	58	124
Meadow View Drive	Churn Creek Road	Airport Road	3,100	87	13	2	5	50	47	101
Churn Creek Road	Interstate 5	Victor Avenue	9,500	87	13	2	5	50	99	214
Churn Creek Road	Victor Avenue	Knighton Road	3,600	87	13	2	5	50	52	112
Churn Creek Road	Knighton Road	Airport Road	2,600	87	13	2	5	50	42	90
Knighton Road	Interstate 5	Churn Creek Road	4,700	87	13	2	5	50	62	134
Riverside Avenue	Interstate 5	Airport Road/North Street	7,000	87	13	2	5	50	81	174

Source: FHWA RD-77-108 with inputs from Omni Means, Caltrans, and Bollard & Brennan, Inc.

4.9.2 AFFECTED ENVIRONMENT/ENVIRONMENTAL SETTING – ALTERNATIVE 3

Existing Noise Environment in the Project Vicinity

A short-term ambient noise survey was conducted in the immediate project vicinity on April 27, 2004 by Bollard & Brennan, Acoustical Consultants for the Shastina Ranch Subdivision. **Table 4.9-4** identifies the locations of the ambient noise measurement sites and the results. A Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter was used for the ambient noise level measurement survey. The meter was calibrated before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

The noise level meter was programmed to record the maximum and average noise levels at each site during the survey. The maximum value, denoted Lmax, represents the highest noise level measured. The average value, denoted Leq, represents the energy average of all of the noise received by the sound level meter microphone during the monitoring period. The ambient noise level measurement results are provided in **Table 4.9-4**

The ambient noise survey results indicate that the measured daytime ambient noise levels at the project site are fairly typical of semi-rural areas affected primarily by nearby traffic noise sources when aircraft are not present). A specific assessment of baseline, baseline plus project, cumulative plus project without the Shasta View Drive extension, and cumulative plus project with the Shasta View Drive extension traffic noise levels is provided later in this section, as is a separate evaluation of aircraft noise.

TABLE 4.9-4
AMBIENT NOISE MONITORING RESULTS
ALTERNATIVE 3 PROJECT VICINITY – APRIL 27, 2004

Site	Location	Average (Leq)	Maximum (Lmax)	Noise Sources
1	Northwest end, at the southern end of Woodview Drive	51	67	Very quiet. Some small aircraft overflights.
2	Northern Central area, at the southern end of Bo Peep Lane	36	52	Very quiet. Some small aircraft overflights.
3	Southern end of Rancho Vista Way.	49	67	Very quiet. Some small aircraft overflights.
4	Southern Central end, off Sylvia Way	36	48	Very quiet. Some small aircraft overflights.

Existing Traffic Noise Environment in Project Vicinity

To predict noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model FHWA RD-77-108) was used. The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to

predict hourly Leq values for free-flowing traffic conditions. To predict noise levels in terms of Ldn, the daytime and nighttime distribution of traffic must be included in the computations.

Traffic volumes were obtained from the project transportation consultant, Omni-Means, Ltd., in the form of peak morning and afternoon hour intersection movements. The p.m. peak hour traffic volumes were compiled into segment volumes and converted to daily traffic volumes using a factor of 10. Truck usage on the local area roadways was estimated from published Caltrans traffic counts and Bollard & Brennan, Inc. site observations.

The FHWA Model input data for all major project-area roadways for baseline and cumulative conditions are provided in **Table 4.9-5**. The Table shows the predicted existing traffic noise levels in terms of the Day/Night Average Level descriptor (Ldn) at a standardized distance of 100 feet from the centerlines of the existing project-area roadways for existing conditions, as well as distances to existing traffic noise contours. The extent by which existing land uses in the project vicinity are affected by existing traffic noise depends on their respective proximity to the roadways and their individual sensitivity to noise.

Existing Aircraft Noise Environment in the Project Vicinity

The Redding Municipal Airport is located east of the Project area, on Airport Road. The main runway (16-34) runs nearly north-south in direction, so approaching and departing aircraft utilizing this runway would not typically fly over the project site. Operations on the less frequently used crosswind runway (12-30) would fly over the project site. However, because existing and projected future traffic on the crosswind runway is so light, the noise exposure contours for both existing and future conditions indicate that the noise impact contours for this runway (as well as the main runway) are located well away from the project site.

In addition to fixed wing aircraft operations, Redding Municipal Airport supports various helicopter operations. Mr. Rod Dinger, Airport Manager, reported that the California Highway Patrol, Redding Air Service, Air Shasta Rotor & Wing, Mercy Air Ambulance, Redding Medical Center, U.S. Forest Service, California Department of Forestry, and the United States military all utilize the Redding Municipal Airport at various times for service and training. Due to the variability of these operations, it is unlikely that annual average forecasts of helicopter Ldn values would be significant at the project site, and no noise exposure contours have been prepared for these operations. Nonetheless, helicopter overflights of the Project area were observed.

4.9.3 REGULATORY FRAMEWORK

A. Related Federal Regulations

There are several Federal laws which address noise issues; these usually are of major concern primarily to noise producers and affect highways, airports and noise producing equipment and vehicles.

The HUD Noise Regulation (24 CFR Part 51B) was published on July 12, 1979. The regulation establishes Departmental standards for HUD assisted projects and actions, requirements, and guidelines on noise abatement and control, replacing and revising the noise policies, standards and procedures previously set forth in HUD Circular 1390.2, dated August 4, 1971.

TABLE 4.9-5 FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL DATA INPUTS AND DISTANCES TO 60 AND 65 DB LDN CONTOURS ALTERNATIVE 3ROADWAYS - EXISTING CONDITIONS						
Roadway Name	Description		Existing ADT	Distance from Centerline to Noise Contour (Feet)		
	From	To		Predicted Ldn, dB @ 100 feet	60 dB Ldn	65 dB Ldn
Interstate 5	Hartnell Avenue	S. Bonnyview Rd.	53,000	76.8	1,321	613
Interstate 5	S. Bonnyview Rd.	Knighton Road	50,000	76.6	1,285	596
Interstate 5	South of Knighton Road	Knighton Road	48,500	76.7	1,296	602
SR 44	West of Airport Road	Knighton Road	22,300	69.1	403	187
SR 44	East of Airport Road	Knighton Road	15,900	67.7	328	152
Hartnell Avenue	Interstate 5	Shasta View Drive	13,995	67.5	318	148
Hartnell Avenue	Shasta View Drive	Airport Road	2,030	59.7	95	44
Churn Creek Road	Interstate 5	Victor Avenue	10,520	67.0	293	136
Churn Creek Road	Rancho Road	Knighton Road	4,150	62.8	155	72
Rancho Road	Shasta View Drive	Airport Road	4,510	63.8	181	84
Knighton Road	Interstate 5	Churn Creek Road	6510	64.7	206	96
Knighton Road	Churn Creek Road	Airport Road	5,080	63.4	169	78
Argyle Road	Hartnell Avenue	Airport Road	2,530	58.4	79	37
Airport Road	SR 44	Hartnell Avenue	13,450	66.9	289	134
Airport Road	Argyle Road	Rancho Road	11,960	66.9	289	134
Airport Road	Rancho Road	Knighton Road	9,980	66.0	249	116
Shasta View Drive	Hartnell Avenue	Rancho Road	2,110	62.8	153	71
Shasta View Drive	Rancho Road	New East-West Connector	Does Not Exist	NA	NA	NA
New East-West Connector	Shasta View Drive	Airport Road	Does Not Exist	NA	NA	NA
Shasta View Drive	New East-West Connector	Knighton Road	Does Not Exist	NA	NA	NA
Note: Acoustically Soft site assumed. Noise contour distances do not include shielding provided by intervening topography or existing or proposed structure.						

HUD's regulations do not contain standards for interior noise levels. Rather a goal of 45 decibels is set forth and the attenuation requirements are geared towards achieving that goal. It is assumed that with standard construction any building will provide sufficient attenuation so that if the exterior level is 65 L{Sub dn} or less the interior level will be 45 L(Sub dn} or less.

B. Shasta County General Plan

The Shasta County Noise Element establishes noise limits for various land-use categories in terms of daytime and nighttime average (Leq) noise levels for non-transportation noise sources, as well as standards in terms of Day/Night Average Levels (Ldn) for transportation noise sources. The Noise Element standards which would be applicable to this project are summarized in **Table 4.9-6**.

TABLE 4.9-6
EXTERIOR NOISE LEVEL STANDARDS APPLIED AT RESIDENTIAL USES
SHASTA COUNTY NOISE ELEMENT

Noise Source Regulated	Time Period	Descriptor	Noise Standard
Non-Transportation (On-site Activities)	Daytime (7 am - 10 pm)	Leq	50[a]
	Nighttime (10 pm - 7 am)	Leq	45[a]
Transportation (Off-Site Traffic)	24-hour Weighted Average	Ldn	60-65[b]

Source: Tables 4 and 5, Shasta County Noise Element.

Notes: a. These standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds.
If the existing ambient noise level exceeds these standards, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.
b. Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn may be allowed provided that available exterior noise level reduction measures have been implemented.

C. City of Redding General Plan

Like the Shasta County Noise Element, the City of Redding Noise Element establishes noise limits for various land-use categories in terms of daytime and nighttime average (Leq) noise levels for non-transportation noise sources, as well as standards in terms of Day/Night Average Levels (Ldn) for transportation noise sources. The City of Redding Noise Element standards which would be applicable to this project are summarized in **Table 4.9-7**.

The City of Redding General Plan Noise Element establishes gods, policies, and criteria for determining land use compatibility with major noise sources within the community. The following provides the applicable goals, policies, and criteria for evaluating the feasibility and potential noise impacts both on and due to the proposed Shastina Ranch Subdivision development project.

Goal N1 **Protect residents from the harmful and annoying effects of exposure to excessive noise.**

Policy N1C Require an acoustical analysis for new development in locations where exterior and/or interior noise levels will likely exceed the City's noise standards to determine appropriate mitigation measures.

Policy N1D Encourage the use of site planning and building materials/design as primary methods of noise attenuation.

Policy N1F Discourage use of noise barriers and walls constructed exclusively for noise attenuation purposes, where possible. In instances where noise barriers cannot be avoided, require the use of site planning and building material/design features in conjunction with barriers to mitigate visual impacts and reduce the size of barriers.

Consistency Analysis

A noise barrier will need to be constructed to protect the existing residence located immediately to the southwest of the southern Stillwater Creek Bridge for Alternatives 1 and 2. Noise barriers and setbacks to reduce impacts of noise on the existing residents along Rancho Road for Alternative 3 will also be required. These provisions will provide consistency with this Goal and Policies.

TABLE 4.9-7
EXTERIOR NOISE LEVEL STANDARDS APPLIED AT RESIDENTIAL USES
CITY OF REDDING

Noise Source Regulated	Time Period	Descriptor	Noise Standard
Non-Transportation (On-site Activities)	Daytime (7 am - 10 pm) Nighttime (10 pm - 7 am)	Leq Leq	55[a] 45[a]
Transportation (Off-Site Traffic)	24-hour Weighted Average	Ldn	60-65[b]

Source: Tables 5-5 and 5-6, Redding Noise Element.

Notes: a. These standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds. If the existing ambient noise level exceeds these standards, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.

b. Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn may be allowed provided that available exterior noise level reduction measures have been implemented.

Goal N2 Protect residents from exposure to excessive transportation-related noise.

Policy N2A Update existing and projected noise contours periodically for all transportation noise sources.

Policy N2C Mitigate noise created by new transportation noise sources consistent with the levels specified in Table 5-4 (**Table 4.9-8** of this section) in outdoor activity areas and interior spaces of existing noise-sensitive land uses.

Policy N2D Consider the significance of noise-level increases associated with roadway-improvement projects needed to accommodate buildout of the General Plan. Since it may be impractical to reduce increased traffic noise to levels in Table 5-4 (**Table 4.9-8** of this section), the following criteria may be used as a test of significance for roadway-improvement projects:

- Where existing traffic noise levels are less than 60 dB L_{dn} in the outdoor-activity areas of noise-sensitive uses, roadway

improvement projects which increase noise levels to 60 dB L_{dn} will not be considered significant.

- Where existing traffic noise levels range between 60 and 65 dB L_{dn} in the outdoor-activity areas of noise-sensitive uses, a +3 dB L_{dn} increase in noise levels due to a roadway-improvement project will be considered significant.

- Where existing traffic noise levels are greater than 65 dB L_{dn} in the outdoor-activity areas of noise-sensitive uses, a +1.5 dB L_{dn} increase in noise levels due to a roadway- improvement project will be considered significant.

Policy N2F Minimize motor vehicle noise impacts from streets and highways through proper route location and sensitive roadway design by employing the following strategies:

- Consider the impacts of truck routes, the effects of a variety of truck traffic, and future motor vehicle volumes on noise levels adjacent to master planned roadways when improvements to the circulation system are planned.

- Mitigate traffic volumes and vehicle speed through residential neighborhoods.

- Work closely with Caltrans in the early stages of highway improvements and design modifications to ensure that proper consideration is given to potential noise impacts on the City.

TABLE 4.9-8

TABLE 5-4 FOR THE CITY OF REDDING GENERAL PLAN MAXIMUM ALLOWABLE NOISE EXPOSURE – TRANSPORTATION NOISE SOURCES

Land Use	Outdoor Activity Areas[1] L_{dn}/CNEL, dB	Interior Spaces	
		L_{dn}/CNEL, dB	L_{eq}, dB[2]
Residential	60[3]	45	--
Transient Lodging	60[3]	45	--
Hospitals, Nursing Homes	60[3]	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60[3]	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

[1] The exterior noise-level standard shall be applied to the outdoor activity area of the receiving land use. Outdoor activity areas are normally located near or adjacent to the main structure and often occupied by porches, patios, balconies, etc.

[2] As determined for a typical worst-case hour during periods of use.

[3] Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less, using a practical application of the best-available, noise-reduction measures, higher exterior noise levels may be allowed provided that practical exterior noise-level reduction measures have been implemented and that interior noise levels are in compliance with this table.

Consistency Analysis

Some of the adjacent existing and future residential areas will be impacted by traffic noise for all the Alternatives. Residences adjacent to Alternative 3 could be impacted by noise levels in outdoor activity areas and interior spaces. Adherence to City General Plan Table 5-4 (**Table 4.9.8** of this section) will provide consistency with this Goal and related policies.

Goal N3 **Protect the economic base of the City of Redding by preventing incompatible land uses from encroaching upon existing or planned noise-producing uses.**

Prevent the introduction of new fixed noise sources in noise-sensitive areas.

Policy N3B Mitigate noise created by new proposed nontransportation sources consistent with the noise-level standards of Table 5-5 (**Table 4.9-9** in this section) as measured immediately within the property line of lands designated for noise-sensitive land uses. Noise- level standards for non-noise-sensitive uses will generally be 10 dB higher before mitigation is required.

Policy N3C Require acoustical analysis of new nonresidential land uses and the expansion of existing nonresidential land uses if likely to produce noise levels exceeding the performance standards of Table 5-5 (**Table 4.9-9** in this section) within the property line of existing or planned noise-sensitive uses.

Policy N3D Limit the siting of loading and shipping facilities for commercial and industrial land uses adjacent to residential parcels, whenever practicable.

Policy N3E Require that parking areas for commercial and industrial land uses be set back from adjacent residential areas to the maximum extent feasible or buffered and shielded by walls, fences, berms, and/or landscape.

Policy N3F Require that parking structures serving commercial or industrial land uses be designed to minimize the potential noise impacts both on site and on adjacent properties. Design measures may include the use of materials that mitigate sound transmission and the configuration of interior spaces to minimize sound amplification and transmission.

Policy N3G Encourage existing major fixed noise sources throughout the City of Redding to voluntarily install additional noise-buffering or reduction mechanisms within their facilities to reduce noise impacts to the lowest level practicable.

Policy N3H Require the installation of noise-buffering or reduction mechanisms, where appropriate, for major fixed noise sources throughout the City prior to the approval, amendment, and/or issuance of conditional use permits for these facilities.

TABLE 4.9-9

NOISE LEVEL PERFORMANCE STANDARDS FOR NEW PROJECTS AFFECTED BY OR INCLUDING NONTRANSPORTATION NOISE SOURCES

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Leq, dB	55	45

Each of the noise levels specified above shall be lowered by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises (e.g., humming sounds, outdoor speaker systems). These noise-level standards do not apply for residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). The City can impose noise-level standards which are more restrictive than those specified above based upon determination of existing low ambient noise levels.

Industrial, light industrial, commercial, and public-service facilities which have the potential for producing objectionable noise levels at nearby noise-sensitive uses are dispersed throughout the City. Fixed noise sources which are typically of concern include, but are not limited to, the following:

HVAC Systems	Cooling Towers/Evaporative Condensers	Drill Rigs
Pump Stations	Lift Stations	Gas or Diesel Motors
Emergency Generators	Boilers	Cutting Equipment
Steam Valves	Steam Turbines	Welders
Generators	Fans	Blowers
Air Compressors	Heavy Equipment	Outdoor Speakers
Conveyor Systems	Transformers	
Pile Drivers	Grinders	

The types of uses which may typically produce the noise sources described above include, but are not limited to: industrial facilities, including lumber mills, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields.

Policy N3I Require residential development projects, newly developed residential areas, and noise-sensitive projects to be responsible for noise mitigations to lessen the impacts from adjacent and nearby industrial uses and urban activities when the following conditions exist:

- If, at the time of development, the industrial uses complied with all the noise mitigations based on anticipated noise sources and noise levels.
- If, at the time of development, adjacent vacant land is designated for commercial or industrial development.
- The noise level measured at the residential property line exceeds the residential noise standards due to the cumulative effect of nearby existing industrial and new industrial noise sources and increased noise levels of urban activities (i.e., traffic, trains, aircraft, etc.)
- The industrial use emitting the noise conforms with the land use classification of the General Plan, zoning district, and all conditions of City permits.
- The industrial use has not added additional noise-producing equipment or substantially changed its hours of operation from what has been approved by the City.

Consistency Analysis

The Project and/or proposed adjacent residential development will be consistent with the General Plan through adherence to the above Goal and related policies.

Policy N3G Encourage existing major fixed noise sources throughout the City of Redding to voluntarily install additional noise-buffering or reduction mechanisms within their facilities to reduce noise impacts to the lowest level practicable.

Policy N3H Require the installation of noise-buffering or reduction mechanisms, where appropriate, for major fixed noise sources throughout the City prior to the approval, amendment, and/or issuance of conditional use permits for these facilities.

Policy N3I Require residential development projects, newly developed residential areas, and noise-sensitive projects to be responsible for noise mitigations to lessen the impacts from adjacent and nearby industrial uses and urban activities when the following conditions exist:

- If, at the time of development, the industrial uses complied with all the noise mitigations based on anticipated noise sources and noise levels.
- If, at the time of development, adjacent vacant land is designated for commercial or industrial development.
- The noise level measured at the residential property line exceeds the residential noise standards due to the cumulative effect of nearby existing industrial and new industrial noise sources and increased noise levels of urban activities (i.e., traffic, trains, aircraft, etc.)
- The industrial use emitting the noise conforms with the land use classification of the General Plan, zoning district, and all conditions of City permits.
- The industrial use has not added additional noise-producing equipment or substantially changed its hours of operation from what has been approved by the City.

Consistency Analysis

The Project and/or proposed adjacent residential development will be consistent with the General Plan through adherence to the above Goal and related policies.

4.9.4 ENVIRONMENTAL CONSEQUENCES/IMPACTS AND MITIGATION MEASURES

A. Basis for Environmental Consequences/Impacts – All Alternatives

Impacts are measured against existing or baseline conditions. A combination of existing literature and application of accepted noise prediction modeling was used to predict changes in ambient noise levels resulting form development of the various Project Alternatives. Specific noise sources evaluated include construction, traffic, and airplane noise.

B. Thresholds of Significance

CEQA guidelines, City of Redding and the Shasta County General Plan Noise Elements have been used to establish impact standards for this section. It is generally recognized that an increase of at least 3 dB is usually required before most people will perceive a change in noise levels, and an increase of 5 dB is required before the change will be clearly noticeable. A common practice is to assume that a clearly noticeable increase of 5 dB will trigger a finding of significance, however, the City's General Plan establishes 3 dB as the significance criteria should noise levels increase within the 60 to 65 dB range and 1.5 dB for noise level increases above 65 dB. Implementation of the project could result in significant noise impacts if the following occurs:

a. Exposure of persons to or generation of noise levels in excess of standards established in **Table 4.9-7** and **Table 4.9-8**.

Alternative 1, 2, and 3

Adherence to the standards in the Tables and the utilization of fundamental noise control techniques which are advanced as mitigation will result in ***less than significant impact.***

b. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, defined as 3 dB.

Alternative 1, 2, and 3

Permanent increases in ambient noise levels in the vicinity of the respective Alternatives due to the project's contribution to cumulative traffic noise levels is predicted to be greater than 3 dB on several roadway segments. Alternatives 1 and 2 increase noise along realigned Hartnell and Rancho Road where there are existing noise-sensitive land uses (residences and a private school). Approximately 8 existing residences along Old Oregon Trail (2) and Airport Road (6) would also be impacted. Alternative 3 traffic increases noise impacting residences along Churn Creek Road between Rancho Road and Knighton Road. Therefore, potential impacts are considered ***significant*** *requiring* ***mitigation.***

c. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, defined as 3 dB.

Alternative 1, 2, and 3

Construction related activities will result in elevated noise levels, but ***mitigation*** *is advanced to reduce the impact to a* ***less than significant impact level****.*

C. Analysis of Environmental Consequences/Impacts & Mitigation Measures

Alternatives 1 and 2

Off-Site Traffic Noise

The assessment of noise generated by off-site traffic was evaluated through a comparison of existing and cumulative, project and no-project traffic noise levels. Traffic data for this project was obtained from the traffic analysis prepared by Omni Means (December 2001). **Table 4.9-9** shows the changes in noise levels for existing and cumulative conditions due to the project, and the change in noise levels associated with the project.

Construction Noise Impact Assessment:

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. Activities involved in construction would generate maximum noise levels, as indicated in **Table 4.9-10**, ranging from 85 to 90 dB at a distance of 50 feet. Construction activities would be temporary in nature and are anticipated to occur during normal daytime working hours.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A significant project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from construction sites. This noise increase would be of short duration, and would likely occur primarily during daytime hours.

On-Site Noise Source Impact Assessment Methodology

The types of uses which are allowed within the proposed business park include industrial, manufacturing, assembly, wholesale trade, distribution, information services, professional office, and commercial type uses. The noise generation of these uses can vary considerably, with certain types of manufacturing processes generating high noise levels while professional and administrative office uses generate negligible levels of noise. Furthermore, if a very loud process is housed inside an equipment building, it may not even be audible outside of the building despite the high noise generation of the source. Due to the myriad possibilities for noise sources, locations, and operating characteristics, it is infeasible to predict project-specific noise impacts for future uses within the business park.

Due to the considerable distance between what will be the nearest business park uses to the existing residences to the east, and the proposed noise wall and/or earthen berm, or a combination thereof, adjacent to those residences, the potential for adverse noise impacts on the nearest residences from on-site activities is projected to be low. Nonetheless, the zoning of the business park allows for certain uses which could generate significant noise levels. Therefore, the potential for off-site adverse noise impacts exists, even though it cannot practically be quantified at this time.

Although the makeup of the uses within the business park is unknown at this time, it is likely that many of the future uses developed within the business park will utilize trucks for the delivery of raw materials and shipment of finished products, particularly uses involved in manufacturing, assembly, and warehousing and distribution facilities. Noise generated by truck movements is analyzed under the "Off-Site Traffic Noise Impact Assessment Methodology" section of this report.

TABLE 4.9-9
PREDICTED TRAFFIC NOISE LEVELS - LDN 100 FEET FROM CENTERLINE
ALTERNATIVES 1 AND 2 PROJECT VICINITY

Roadway	From	To	Existing	Existing + Project	Noise Increase	Cumulative	Cumulative + Project	Noise Increase
Airport Road	S.R. 44	Hartnell Avenue	66	70	4	68	71	3
Airport Road	Hartnell Avenue	Rancho Road	65	69	4	68	70	2
Airport Road	Rancho Road	Knighton Road Ext.	66	67	1	68	69	1
Airport Road	Knighton Road Ext.	Fig Tree Lane	65	66	1	67	68	1
Airport Road	Fig Tree Lane	Riverside Avenue	65	68	3	67	69	2
Old Oregon Trail	Airport Road	Rancho Road	54	64	10	55	64	9
Hartnell Avenue	Argyle Road	Airport Road	60	60	0	65	67	1
Argyle Road	Hartnell Avenue	Airport Road	59	63	4	60	60	0
Rancho Road	Churn Creek Road	Airport Road	62	66	4	64	67	3
Meadow View Drive	Churn Creek Road	Airport Road	60	60	0	64	64	0
Churn Creek Road	Interstate 5	Victor Avenue	65	67	2	66	68	2
Churn Creek Road	Victor Avenue	Knighton Road	61	61	0	63	63	0
Churn Creek Road	Knighton Road	Airport Road	59	59	0	60	60	0
Knighton Road	Interstate 5	Churn Creek Road	62	64	2	65	66	1
Knighton Road	Churn Creek Road	Airport Road	N/A	64	64	64	66	2
Riverside Avenue	Interstate 5	Airport Road/North Street	64	65	1	65	66	1

Source: Omni-means and Bollard & Brennan, Inc.

TABLE 4.9-10 CONSTRUCTION EQUIPMENT NOISE	
Type of Equipment	**Maximum Level, dB at 50 feet**
Bulldozers	87
Heavy Trucks	88
Backhoe	85
Pneumatic Tools	85
Source: Environmental Noise Pollution, Patrick R. Cunniff, 1977.	

Impact 4.9.4-1

Any noise problem may be considered as being composed of three basic elements: the noise source, a transmission path, and a receiver. The appropriate acoustical treatment for a given project should consider the nature of the noise source and the sensitivity of the receiver. The problem should be defined in terms of appropriate criteria (L_{dn}, L_{eq}, or L_{max}), the location of the sensitive receiver (inside or outside), and when the problem occurs (daytime or nighttime). Traffic noise control techniques should then be selected to provide an acceptable noise environment for the receiving property while remaining consistent with local aesthetic standards and practical structural and economic limits. Without instituting fundamental noise control techniques, noise, particularly from traffic could be considered a **potentially significant impact**.

The project will generate increased traffic on the existing roadway network. According to **Table 4.9-9**, the project-generated traffic is expected to result in traffic noise level increases over existing/baseline levels ranging from 0 to 10 dB Ldn.

Pursuant to the City of Redding's General Plan significance criteria, a substantial increase in traffic noise levels is defined as 3 dB. **Table 4.9-9** identifies that Airport Road between SR 44 and Rancho Road, Old Oregon Trail between Airport Road and Rancho Road, Argyle Road between Hartnell Avenue and Airport Road, and Rancho Road between Churn Creek Road and Airport Road have increases in excess of 3 dB. Traffic from Alternatives 1 and 2 will impact existing and future residences, considered sensitive receptors, along Argyle Road, Rancho Road, and at certain locations along Old Oregon Trail and Airport Road.

Mitigation Measure 4.9.4-1

The following fundamental noise control techniques should be considered when reviewing individual projects to be developed on the parcels within the business park. For off-site road mitigation, City policy requires noise barriers in the form of walls or berms, or combination thereof along arterial streets that abut residential uses. Therefore, when off-site road improvements are constructed in the future to accommodate ultimate buildout of the business park, noise barriers will have to be constructed along Rancho Road, Argyle Road, and in limited locations along Old Oregon Trail and Airport Road where the underlying General Plan designation is residential. Noise tests should be conducted to confirm that existing thresholds are being exceeded by 3 dB.

Use of Setbacks – Noise exposure may be reduced by increasing the distance between the noise sources and receiving use. Setback areas can take the form of open space, frontage roads, recreational areas, storage yards, etc. The available noise attenuation from this technique is limited

by the characteristics of the noise source, but is generally about 4 to 6 dB per doubling of distance from the source.

Use of Barriers – Shielding by barriers can be obtained by placing walls, berms or other structures, such as buildings, between the noise source and the receiver. The effectiveness of a barrier depends upon blocking line-of-sight between the source and receiver, and is improved with increasing the distance the sound must travel to pass over the barrier as compared to a straight line from source to receiver. The difference between the distance over a barrier and a straight line between source and receiver is called the "path length difference," and is the basis for calculating barrier noise reduction.

Barrier effectiveness depends upon the relative heights of the source, barrier, and receiver. In general, barriers are most effective when placed close to either the receiver or the source. An intermediate barrier location yields a smaller path-length-difference for a given increase in barrier height than does a location closer to either source or receiver.

For maximum effectiveness, barriers must be continuous and relatively airtight along their length and height. To ensure that sound transmission through the barrier is insignificant, barrier mass should be about 4 lbs. /square foot, although a lesser mass may be acceptable if the barrier material provides sufficient transmission loss. Satisfaction of the above criteria requires substantial and well-fitted barrier materials, placed to intercept line of sight to all significant noise sources. Earth, in the form of berms or the face of a depressed area, is also an effective barrier material.

The attenuation provided by a barrier depends upon the frequency content of the source. Generally, higher frequencies are attenuated (reduced) more readily than lower frequencies. This results because a given barrier height is relatively large compared to the shorter wavelengths of high frequency sounds, while relatively small compared to the longer wavelengths of the frequency sounds. The effective center frequency for traffic noise is usually considered to be 550 Hz. Railroad engines, cars and horns emit noise with differing frequency content, so the effectiveness of a barrier will vary for each of these sources. Frequency analyses are necessary to properly calculate barrier effectiveness for noise from sources other than highway traffic.

Site Design – Buildings can be placed on a project site to shield other structures or areas, to remove them from noise-sensitive areas, and to prevent an increase in noise level caused by reflections. The use of one building to shield another can significantly reduce overall noise levels. Another option in site design is the placement of relatively insensitive land uses, such as commercial or storage areas, between the noise source and noise-sensitive receivers.

Site design should also guard against the creation of reflecting surfaces which may increase onsite noise levels. For example, two buildings placed at an angle facing a noise source may cause noise levels within that angle to increase by up to 3 dB. The open end of "U"-shaped buildings should point away from noise sources for the same reason. Landscaping walls or noise barriers located within a development may inadvertently reflect noise back to a noise-sensitive area unless carefully located. Avoidance of these problems while attaining an aesthetic site design requires close coordination between local agencies, the project engineer and architect, and the noise consultant.

Use of Vegetation – Trees and other vegetation are often thought to provide significant noise attenuation. However, approximately 100 feet of dense foliage (so that no visual path extends through the foliage) is required to achieve a 5 dB attenuation of noise. Thus the use of vegetation as a noise barrier should not be considered a practical method of noise control unless large tracts of dense foliage are part of the existing landscape.

Vegetation can be used to acoustically "soften" intervening ground between a noise source and receiver, increasing ground absorption of sound and thus increasing the attenuation of sound with distance. Planting of trees and shrubs is also of aesthetic and psychological value, and may reduce

adverse public reaction to a noise source by removing the source from view, even though noise levels will be largely unaffected.

In summary, the effects of vegetation upon noise transmission are minor, and are primarily limited to increased absorption of high frequency sounds and to reducing adverse public reaction to the noise by providing aesthetic benefits.

Implementation

The City will be responsible for designing and constructing the noise barriers and ensuring that future development within the business park is designed to incorporate noise attenuation techniques. An acoustical consultant would undertake any noise testing to occur in the future.

Significance After Mitigation

Implementation of the mitigation measures will reduce on-site and off-site project related impacts to a level that is **less than significant**.

Impact 4.9.4-2

Noise impacts associated with future uses developed within the Project area cannot practically be evaluated due to the wide range of variables which will affect such noise generation. Nonetheless, because noise-producing uses would be allowed under the proposed land use zoning, and because there are existing noise sensitive land uses on the east side of the Project area, this impact is considered **potentially significant**.

Mitigation Measure 4.9.4-2

The CC&R's shall require all uses developed within the Park to generate noise levels which comply with City of Redding and Shasta County Noise Element standards at nearby residential uses.

During project review, the Development Services Director shall make a determination as to whether or not the proposed use would likely generate noise levels which could adversely affect residences to the east. If it is determined from this review that proposed uses could generate excessive noise levels at existing noise-sensitive uses, the applicant shall be required to prepare an acoustical analysis to ensure that all appropriate noise control measures are incorporated into the project design so as to mitigate any noise impacts. Such noise control measures include, but are not limited to, use of noise barriers, site-redesign, silencers, partial or complete enclosures of critical equipment, etc.

Implementation

The City will be responsible for developing the CC&R's and determining if proposed uses would likely generate noise levels which would adversely affect residences to the east.

Significance After Mitigation

Implementation of the mitigation measures will ensure that uses do not adversely affect residences to the east thereby reducing the impact to a level that is **less than significant**.

Impact 4.9.4-3

Activities associated with construction will result in elevated noise levels, with maximum noise levels ranging from 85-90 dB at 50 feet. Construction activities would be temporary in nature and would likely occur during normal daytime working hours. Nonetheless, because construction activities would result in periods of elevated noise levels, this impact is considered **potentially significant.**

Mitigation Measure 4.9.3-3

> *Construction activities should adhere to the requirements of the City of Redding respect to hours of operation. Implementation of this mitigation measures would reduce this impact to a* ***less than significant level****.*

Implementation

The City will be responsible for limiting and enforcing the hours of construction.

Significance After Mitigation

Implementation of the mitigation measures will reduce construction noise impacts to a level that is **less than significant**.

Alternative 3

Off-Site Traffic Noise

The assessment of noise generated by off-site traffic was evaluated through a comparison of existing and project buildout noise levels. Traffic data for this project was obtained from the traffic analysis prepared by the City of Redding (July 2004). **Table 4.9-10** shows the changes in noise levels for existing plus buildout conditions due to the project, and the change in noise levels associated with the project.

Construction Noise Impact Assessment:

The construction noise impacts assessment discussion associated with Alternatives 1 and 2 is also applicable to Alternative 3.

On-Site Noise Source Impact Assessment Methodology

The on-site noise source impact assessment methodology associated with Alternatives 1 and 2 is also applicable to Alternative 3.

Impact 4.9.4-4

Permanent increases in ambient noise levels in the vicinity of Alternative 3 due to the project's contribution to cumulative traffic noise levels is predicted to be greater than 3 dB on several roadway segments. Alternative 3 traffic increases noise impacting residences along Churn Creek Road between Rancho Road and Knighton Road and along Knighton Road between Churn Creek Road and Airport Road. Therefore, potential impacts are considered **significant** requiring **mitigation.**

Mitigation Measure 4.9.4.-4

> *Alternatives 1 and 2* ***Mitigation 4.9.4-1*** *is applicable to Alternative 3 except that noise barriers will be required along Churn Creek Road between Rancho Road and Knighton Road and along Knighton Road between Churn Creek Road and Airport Road when off-site road improvements are constructed in the future to accommodate ultimate buildout of the business park. Noise tests should be conducted to confirm that existing thresholds are being exceeded by 3 dB.*

Implementation

The City will be responsible for designing and constructing the noise barriers and ensuring that future development within the business park is designed to incorporate noise attenuation techniques. An acoustical consultant would undertake any noise testing to occur in the future.

Significance After Mitigation

Implementation of the mitigation measures will reduce on-site and off-site project related impacts to a level that is **less than significant**.

Impact 4.9.4-5

Noise impacts associated with future uses developed within the Project area cannot practically be evaluated due to the wide range of variables which will affect such noise generation. Nonetheless, because noise-producing uses would be allowed under the proposed land use zoning, and because there are existing noise sensitive land uses which are residences on the northwest, north, northeast, and south sides of the Project site, this impact is considered **potentially significant**.

Mitigation Measure 4.9.4.-5

> *When siting future users, significant noise generating users shall not be located adjacent to existing and future residential lands. The PD Plan shall reflect this requirement.*

Implementation

The City will be responsible for developing the PD Plan and CC&R's and determining if proposed uses would likely generate noise levels which would adversely affect residences.

Significance After Mitigation

Implementation of the mitigation measures will ensure that uses do not adversely affect residences to the east thereby reducing the impact to a level that is **less than significant**.

Impact 4.9.4-6

Alternatives 1 and 2 **Impact 4.9.4-4** is applicable to Alternative 3.

Mitigation Measure 4.9.4-6

> *Alternatives 1 and 2* ***Mitigation 4.9.4-4*** *is applicable to Alternative 3.*

Implementation and **Significance After Mitigation**

These are identical to Alternatives 1 and 2

D. **Conclusion**

Alternatives 1, 2, and 3

Implementation of mitigation measures will reduce potential significant impacts related noise impacts to **below a level of significance**. However, Alternative 3 will result in the construction of more noise barriers than the other Alternatives.

No Action Alternative

Under the No-Action Alternative the site and surrounding ambient noise levels will increase as the area develops under that existing General Plan and Zoning, as applicable. Ambient noise levels will increase regardless of whether the proposed Project is implemented or not.

4.9.5 REFERENCES

City of Redding General Plan, Noise Element. October 2000

Blayney-Dyett, Urban and Regional Planners. April 1990. *Redding Municipal Airport Area Plan.*

Pacific Municipal Consultants. August 2004. City of Redding Shastina Ranch Subdivision Draft Environmental Impact Report.

TABLE 4.9-10

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL DATA INPUTS AND DISTANCES TO 60 AND 65 DB LDN CONTOURS
ALTERNATIVE 3 ROADWAYS – EXISTING +BUILDOUT CONDITIONS

Roadway Name	Description		ADT	Existing Ldn, dB @ 100 feet	Predicted Ldn, dB @ 100 feet	Increase	Distance from Centerline to Noise Contour (Feet)	
	From	To					60 dB Ldn	65 dB Ldn
Interstate 5	Hartnell Avenue	S. Bonnyview Rd.	60,990	76.8	77.3	0.5	1431	664
Interstate 5	S. Bonnyview Rd.	Knighton Road	50,000	76.6	76.6	-	1285	596
Interstate 5	Knighton Road	Riverside Avenue	54,270	76.7	77.1	0.4	1390	645
SR 44	Airport Road	Shasta View Drive	26,330	69.1	69.8	0.7	448	208
SR 44	Airport Road	Stillwater Road	17,740	67.7	68.0	0.3	344	160
Hartnell Avenue	Interstate 5	Shasta View Drive	14,910	67.5	68.1	0.6	346	160
Hartnell Avenue	Shasta View Drive	Airport Road	2,260	59.7	59.9	0.2	98	46
Churn Creek Road	Interstate 5	Victor Avenue	20,795	67.0	69.5	2.5	431	200
Churn Creek Road	Rancho Road	Knighton Road	4,150	62.8	72.5	9.7	680	316
Rancho Road	Shasta View Drive	Airport Road	8,210	63.8	65.5	1.7	232	108
Knighton Road	Interstate 5	Churn Creek Road	12,280	64.7	67.2	2.5	304	141
Knighton Road	Churn Creek Road	Airport Road	10,850	63.4	66.7	3.3	280	130
Argyle Road	Hartnell Avenue	Airport Road	2,760	58.4	60.8	2.4	112	52
Airport Road	SR 44	Hartnell Avenue	20,460	66.9	69.5	3.4	427	198
Airport Road	Argyle Road	Rancho Road	19,200	66.9	69.2	2.3	409	190
Airport Road	Rancho Road	Knighton Road	16,800	66.0	68.6	2.6	374	174
Shasta View Drive	Hartnell Avenue	Rancho Road	4,390	62.8	62.8	-	153	71
Shasta View Drive	Rancho Road	New East-West Connector	(Not existing)	NA	NA	NA	NA	NA
New East-West Connector	Shasta View Drive	Airport Road	(Not existing)	NA	NA	NA	NA	NA
Shasta View Drive	New East-West Connector	Knighton Road	(Not existing)	NA	NA	NA	NA	NA

Note: Acoustically Soft site assumed. Noise contour distances do not include shielding provided by intervening topography or existing or proposed structure.