4.6 NOISE

INTRODUCTION

This section discusses the existing noise environment in the immediate project vicinity and identifies potential noise-related impacts and mitigation measures associated with the proposed project. Specifically, this section analyzes potential noise impacts due to and upon development within the project site relative to applicable noise criteria and to the existing ambient noise environment. This section is primarily based on an *Environmental Noise Analysis* prepared by Bollard & Brennan, Inc.,[1] as well as the *City of Davis General Plan*.[2]

ENVIRONMENTAL SETTING

Acoustical Terminology

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect (see Table 4.6-1, Acoustical Terminology.) The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, or Hertz (Hz). Human hearing is generally capable of detecting sound between 20 Hz and 20,000 Hz.

Human hearing is generally capable of processing these pressure variations (sound) over an extremely broad dynamic range; therefore, the measurement of sound directly in terms of pressure would require a very large and awkward range of numbers. The logarithmic treatment of these numbers - converting measured sound pressure (Pa) into sound pressure level (decibels - dB) - was devised primarily to limit the range of numbers; the decibel scale allows for 5 orders of magnitude in sound pressure to be expressed as a range of 100 dB.

The perceived loudness of sounds is dependent on 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 the A-weighting network. A strong correlation exists between A-weighted sound levels (expressed as dBA) and the way the human ear perceives noise. For this reason, the A-weighted sound level has become a standard tool for environmental noise assessment. All noise levels reported in this section 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 (L_{eq}), which corresponds to a steady-state, A-weighted sound level containing

the same total energy as a time-varying signal over a given time period (usually one hour). The L_{eq} is the foundation for the Day/Night Average Noise Level (L_{dn}).

Table 4.6-1
Acoustical Terminology

Acoustics	The science (or physics) of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of noise.
A-Weighting	A frequency-response filter that conditions a given sound signal to approximate human response.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours (10 p.m. - 7 a.m.) weighted by a factor of 10 prior to averaging.
Decibel or dB	A Bel is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bel.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
L_{eq}	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
L_n	The measured sound pressure level exceeded (n) percent of the time.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
SEL	A single-number rating indicating the total energy of a discrete noise event compressed into a 1-second time duration.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB at 1,000 Hz for persons with good hearing.

Source: Bollard & Brennan, Inc.

The L_{dn} is based on the average noise level over a continuous 24-hour period, with a +10 dB weighting applied to noise occurring during nighttime (10 p.m. to 7 a.m.) hours. The nighttime penalty is based on the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Existing Land Uses in the Project Vicinity

The project site is currently vacant and undeveloped, except for a single residence and associated outbuildings located in the south-central portion of the site. The project site is bordered on three sides (east, west, and south) by existing urban/suburban uses, including residential, commercial, park, and golf course. To the north, the site is bordered by existing agricultural uses, as well as the Blue Max Kart Club race track facility. Noise-sensitive land uses in the immediate project vicinity include existing single-family and multi-family residences to the west and east.

Existing Noise Environment in the Project Vicinity

The existing ambient noise environment in the immediate project vicinity is defined primarily by traffic on Pole Line Road, and F Street; California Northern Railroad (CNRR) operations; go-cart racing activities at the Blue Max Kart Club facility; as well as agricultural operations on the project site and in the vicinity. The ambient noise measurement surveys conducted by Bollard & Brennan at four noise measurement points in the vicinity of the project site (Figure 4.6-1, Noise Measurement Locations) revealed that existing noise levels in the immediate project vicinity were consistent with typical commercial and residential land uses in urban settings. Short-term measurements taken at sites 2 and 3 are presented in Table 4.6-2, while long-term measurements are presented in Figures 4.6-2 and 4.6-3 .

Table 4.6-2
Summary of Ambient Noise Level Measurements
15-Minute Sample - October 17, 2003
Covell Village - Davis, California

Site	Location	L_{eq}	L_{max}	Noise Sources
2	Southeast Corner	59	71	Traffic on Pole Line and Covell
3	Southwest Corner	60	67	Traffic on Covell

Source: Bollard & Brennan, Inc.

Figure 4.6-1
Noise Measurement Locations


COVELL VILLAGE
SITE PLAN
Blue Max Kart Club
Wild Horse Golf Course
Pole Line Rd.
Moore
Bike Path Connection
Donner
Picasso
Land Dedication
Nugget Center
Village Center
School
Park
Senior Care Facilities
Co-Housing
Land Dedication
High Density
Fire Station
Hospice
Habitat
Pre-School
Covell Blvd.
Railroad
F Street
North Pond
Bike Path Connection
Single Family 4-6 units per acre
Medium Density 6-10 units per acre
Senior Housing
Noise Measurement Site
TOWN PLANNERS
301 Seventh Street
Davis, CA 95616 (530) 750-2939
Vicinity Map
ASSESSORS PARCEL # 035 - 970 - 33 - 1
PRELIMINARY LAND USE BREAKDOWN
PRELIMINARY BUILDING BREAKDOWN

Figure 4.6-2
Continuous Measured Hourly Noise Levels, Site 1

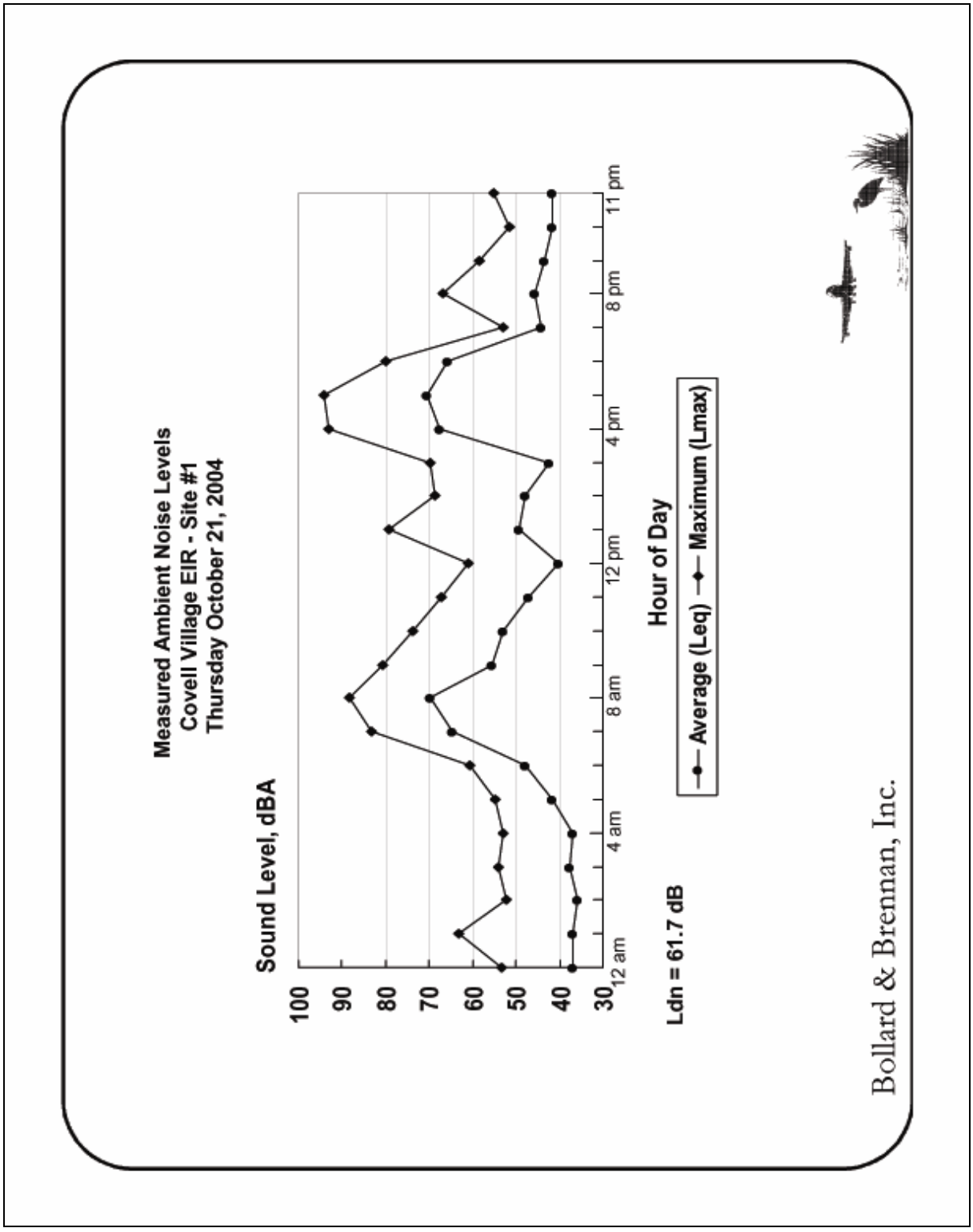

Figure 4.6-3
Continuous Measured Hourly Noise Levels, Site 4

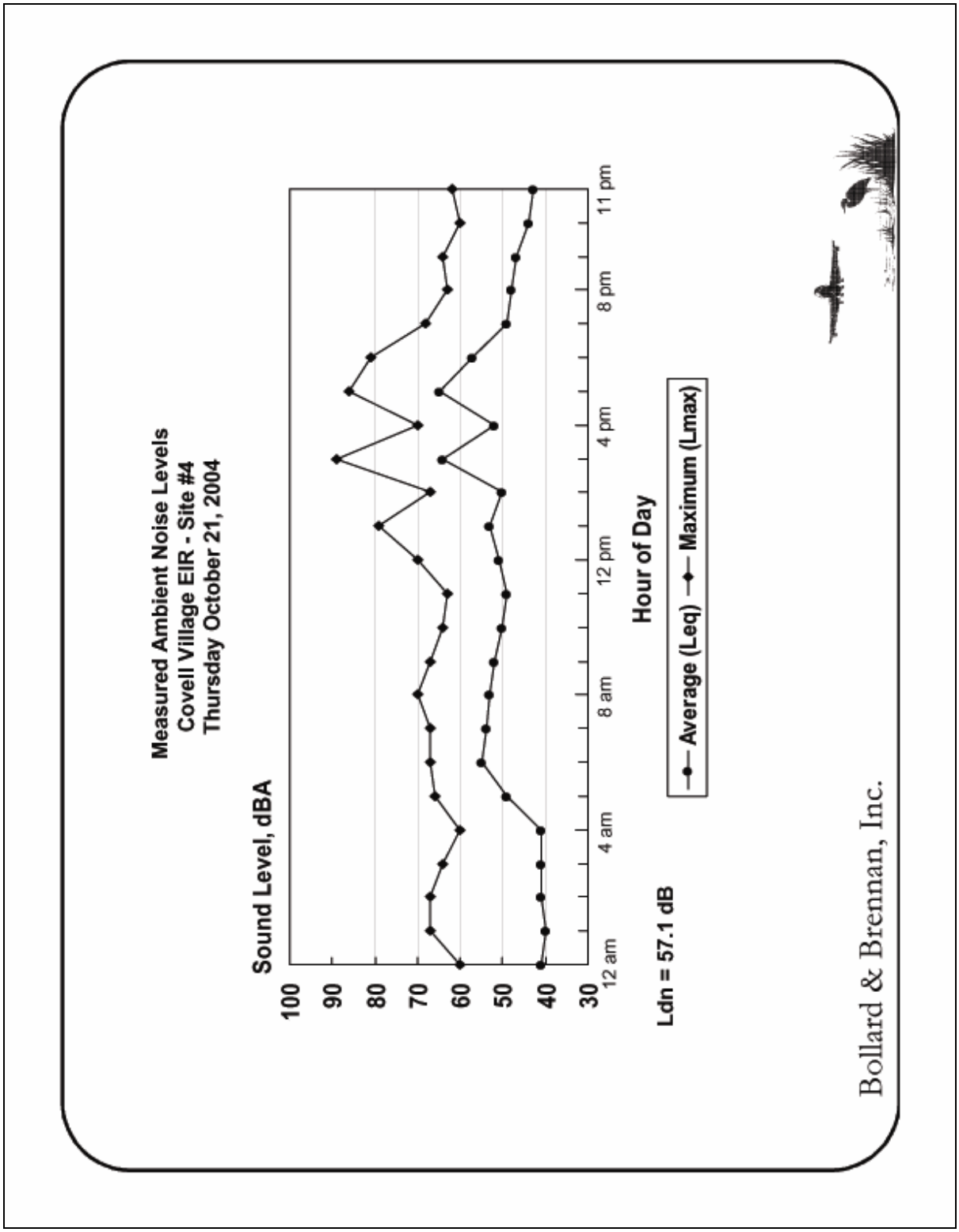

Table 4.6-3
Existing Traffic Noise Levels and Contour Distances
Covell Village - Davis, California

Roadway	Segment	L_{dn} @ 75 Feet (from centerline)	Distance to Contours (feet)		
			70 dB	65 dB	60 dB
Covell Blvd.	W. of F Street	63.9	29	63	136
Covell Blvd.	F Street – J Street	64.2	31	66	142
Covell Blvd.	J Street – L Street	64.0	30	64	139
Covell Blvd.	L Street – Pole Line Rd.	63.8	29	63	135
Covell Blvd.	E. of Pole Line Rd.	62.4	23	50	108
Pole Line Rd.	Covell Village Rd. – Moore Ave.	63.5	28	60	128
Pole Line Rd.	Moore Ave. – Donner Ave.	64.4	32	68	147
Pole Line Rd.	Donner Ave. – Picasso Ave.	65.0	35	75	161
Pole Line Rd.	Picasso Ave. – Covell Blvd.	65.9	40	86	185
Pole Line Rd.	S. of Covell Blvd.	65.0	35	76	163
F Street	N. of Covell Blvd.	61.1	19	41	89
F Street	S. of Covell Blvd.	62.3	23	49	106
J Street	S. of Covell Blvd.	56.7	10	21	45
L Street	Covell Blvd. – Drexel Dr.	56.3	9	20	42
L Street	Drexel Dr. – Eighth Street	56.8	10	21	46
L Street	S. of Eighth Street	58.4	13	27	59
Moore Blvd.	E. of Pole Line Rd.	56.3	9	20	42
Donner Ave.	E. of Pole Line Rd.	53.6	6	13	28
Picasso Ave.	E. of Pole Line Rd.	56.0	9	19	41

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

REGULATORY CONTEXT

In order to limit population exposure to physically and/or psychologically damaging noise levels, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. The City of Davis General Plan Noise Element, Noise Ordinance, and CEQA provide regulations regarding noise levels for uses relevant to the proposed project. The following provides a general overview of the existing regulations established by the City and CEQA.

State Regulations

The California Environmental Quality Act (CEQA) Guidelines in Appendix G, indicates that a significant noise impact may occur if a project exposes persons to noise levels in

excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels.

Local Regulations

City of Davis General Plan

The City of Davis General Plan Noise Element requires that interior noise exposure from exterior noise sources (traffic) within residential dwellings not exceed 45 dB L_{dn} (or CNEL), regardless of exterior noise exposure. This standard is increased to 55 dB L_{dn} or less for office/professional uses.

The City of Davis has established an exterior noise level criterion of less than 60 dB L_{dn} (or CNEL) within outdoor activity areas of residential land uses (i.e. back yards). This standard is adjusted to a level less than 65 dB L_{dn} for office/professional uses. These are considered to be the ANormally Acceptable@ criteria, and may be adjusted upward (60-70 dB L_{dn} for residential, 65-75 dB L_{dn} for office/professional) based on compliance with the interior noise criterion and the City=s discretion.

The following are applicable goals and policies from the City of Davis General Plan related to noise:

Goal NOISE 1	Maintain community noise levels that meet health guidelines and allow for a high quality of life.
Policy NOISE 1.1	Minimize vehicular and stationary noise sources, and noise emanating from temporary activities.
Policy NOISE 1.2	Discourage the use of sound walls whenever alternative mitigation measures are feasible, while also facilitating the construction of sound walls where desired by the neighborhood and there is no other way to reduce noise to acceptable exterior levels shown in Table 19. See the separate General Plan policy interpretation document titled “Major Arterial Landscaping, Noise Attenuation Design and Greenstreets”.
Policy NOISE 1.3	Develop and implement procedures for the accurate measurement and prediction of noise levels in Davis.
Goal NOISE 2	Provide for indoor noise environments that are conducive to living and working.
Policy NOISE 2.1	Take all technically feasible steps to ensure that interior noise levels can be maintained at the levels shown in Table 20.

City of Davis Noise Ordinance

The City of Davis Noise Ordinance establishes a maximum stationary noise level standard of 55 dB during the hours of 7:00 a.m. to 9:00 p.m., and 50 dB during the hours of 9:00 p.m. to 7:00 a.m. These "maximum" criteria are interpreted by Bollard & Brennan to be average hourly levels (L_{eq}).

IMPACTS AND MITIGATION MEASURES

Standards of Significance

Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels at adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed, as discussed previously in the Regulatory Setting Section above. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local planning criteria, or substantially increase noise levels at noise-sensitive land uses. For this analysis, noise impacts associated with the Proposed Project would be considered potentially significant if they:

- exceed the City of Davis General Plan Noise Element thresholds;
- exceed the City of Davis Noise Ordinance significance thresholds; or
- expose existing noise-sensitive land uses to a traffic noise level increase of 3 dB or more.

Method of Analysis

Existing Ambient Noise Assessment

Ambient Noise Level Measurement Surveys

To quantify the existing ambient noise environment in the project vicinity, ambient noise level measurement surveys were conducted at four locations on the project site on October 17, 2003 and October 20-21, 2004. The noise measurement locations are shown in Figure 4.6-1. Long-term (24-hour) measurements were completed at Site 1 (on the northern side of the project site, near the Blue Max Kart Club facility) and Site 4 (on the eastern side of the project site), while short-term (15-minute) samples were collected at Sites 2 and 3.

A Larson-Davis Laboratories (LDL) Model 820 precision integrating sound level meter was used for the noise level measurement surveys. The meter was calibrated before use with a LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters (ANSI S1.4).

Ambient noise level survey results are presented in Figures 4.6-2 and 4.6-3, and Table 4.6-2. The ambient noise measurement surveys revealed that existing noise levels in the immediate project vicinity were consistent with typical commercial/residential land uses in urban/suburban settings.

Existing Roadway Traffic Noise Modeling

To predict existing noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The Model is based on 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 project site. The FHWA Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions. A day/night traffic distribution of 83 percent/17 percent was factored into the calculations to determine L_{dn}. Additionally, a medium/heavy truck split of 2 percent/1 percent was assumed, along with traffic speed of 30-45 MPH.

Traffic volumes for existing conditions were obtained from the Traffic Impact Study prepared for the project by Fehr & Peers Transportation Consultants (October 2004). The data within that report is in the form of AM/PM peak-hour intersection turning movements, which was converted to ADT by Bollard & Brennan.

Table 4.6-3 shows the existing traffic noise levels in terms of L_{dn} at a reference distance of 75 feet from the centerlines of existing project-area roadways. These are considered to be the Abaseline@ conditions. The table also includes the distances to existing traffic noise contours.

Traffic Noise Impact Assessment

The project site may be impacted by traffic noise from F Street, Covell Boulevard, and Pole Line Road, as well as by CNRR operations, and activities at the Blue Max Kart Club. To assess on-site and off-site noise impacts due to project-related traffic increases on the local roadway network, Bollard & Brennan predicted traffic noise levels at a representative distance (75 feet) from the roadway centerline for both the Proposed Project and High Density Alternative scenarios. The traffic noise levels were predicted using the FHWA RD-77-108 modeling methodology described above.

Project Construction Noise Impact Assessment

During the construction phases of the Covell Village Project, noise from building equipment would add to the noise environment in the immediate project vicinity. With implementation of either the Proposed Project or the High Density Alternative, construction activities would be expected to generate maximum noise levels ranging from 85-88 dB at a distance of 50 feet (Table 4.6-4, Construction Equipment Noise Levels).

Construction activities would be temporary in nature and are anticipated to occur during normal daytime working hours (7 a.m.-5 p.m.). Still, residences located along the east and west sides of the project site would likely be impacted by this noise.

Table 4.6-4
Construction Equipment Noise Levels

Type of Equipment	L_{max}, dB at 50 feet
Bulldozers	87
Heavy Trucks	88
Backhoe	85
Pneumatic Tools	85

Source: Environmental Noise Pollution, Patrick R. Cunniff, 1977.

Noise would also be generated during the construction phase by increased truck traffic on local area roadways. A significant project-generated noise source would be truck traffic associated with the transport of heavy materials and equipment to and from the construction site.

General Discussion of Mitigation Measures

Bollard & Brennan identifies general categories of mitigation measures for residential noise impacts. These are as follows:

Use of Setbacks

Noise exposure may be reduced by increasing the distance between the noise source and receiving use. Setbacks can take the form of open space, frontage roads, recreational areas, etc. The available noise attenuation from this technique is limited by the characteristics of the noise source, but is generally 3 to 6 dB per doubling of distance from the source. The Arule-of-thumb@ is that most traffic and railroad noise levels will decrease or increase by approximately 4.5 dB per doubling, or halving of distance, respectively.

Use of Barriers

Noise reduction can be accomplished by placing walls, berms or other structures, such as buildings, between the noise source and the receiver. In addition, intervening topography can be an effective barrier for noise control. The effectiveness of a barrier depends upon blocking line-of-sight between the source and receiver, and is improved with increases in 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 on 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.

To provide the noise level reduction required to meet the City's exterior Noise Element criterion, Bollard & Brennan estimates that property line noise barriers of approximately 6-9 feet in height would be required.

Site Design, Building Locations, and Building Orientations

Buildings can be placed on a project site to shield other structures or areas, to remove them from noise-impacted areas, and to prevent an increase in noise levels caused by reflections. As an example, carports or garages can be used to form or complement a barrier, or shield an outdoor activity area. Placement of outdoor activity areas on the opposite side of the building facades from the noise source, or within the shielded portion of a building complex, such as a central courtyard, can also be an effective method of providing a quiet retreat in an otherwise noisy environment.

Evaluation of Rubberized Asphalt Mitigation Measure Effectiveness

One of the means of reducing overall traffic noise levels is to use a rubberized asphalt pavement or open gap pavement. Studies conducted for the Sacramento County Department of Environmental Review and Assessment and Transportation Department to determine the noise reduction provided by rubberized asphalt have been completed in recent years. Those studies indicate that the use of rubberized asphalt on Sacramento County roadways appears to have resulted in an average traffic noise level reduction of approximately 4 dB over that provided by conventional asphalt.

Project Impacts and Mitigation Measures

4.6-1 Impacts of off-site noise levels to on-site noise-sensitive uses.

Proposed Project

The project site is surrounded on the west, south, and east sides respectively by F Street, Covell Boulevard, and Pole Line Road. Implementation of the Proposed Project would result in the construction of 1,515 residential units, a commercial Village Center, and a hospice facility on the project site, as well as the dedication of a fire station and a school site. Table 4.6-5 demonstrates that under the Existing Plus Proposed Project scenario, project site traffic noise generated by project perimeter roadways would exceed the City of Davis 60 dB L_{dn} exterior noise criterion for outdoor activity areas of residential land uses. As projected by Bollard & Brennan, noise levels could range from 61.8 to 67.9 dB L_{dn} along Covell Boulevard, F Street, and Pole Line Road.

Table 4.6-5
Predicted Traffic Noise Levels at 75 Feet from Roadway Centerlines
- Existing Conditions Plus Proposed Project

Roadway	Segment	L_{dn}, dB (change, dB)
Covell Blvd.	W. of F Street	64.9 (+1.1)*
Covell Blvd.	F Street – J Street	65.8 (+1.6)
Covell Blvd.	J Street – L Street	65.9 (+1.9)
Covell Blvd.	L Street – Pole Line Rd.	65.2 (+1.4)
Covell Blvd.	E. of Pole Line Rd.	63.5 (+1.1)
Pole Line Rd.	N. of Covell Village Rd.	64.3 (NA)
Pole Line Rd.	Covell Village Rd. – Moore Ave.	64.8 (+1.3)
Pole Line Rd.	Moore Ave. – Donner Ave.	66.4 (+2.0)
Pole Line Rd.	Donner Ave. – Picasso Ave.	67.2 (+2.2)
Pole Line Rd.	Picasso Ave. – Covell Blvd.	67.9 (+2.0)
Pole Line Rd.	S. of Covell Blvd.	66.5 (+1.5)
F Street	N. of Covell Blvd.	61.8 (+0.7)
F Street	S. of Covell Blvd.	63.1 (+0.8)
J Street	S. of Covell Blvd.	58.3 (+1.6)
L Street	Covell Blvd. – Drexel Dr.	59.6 (+3.3)
L Street	Drexel Dr. – Eighth Street	59.9 (+3.1)
L Street	S. of Eighth Street	60.6 (+2.2)
Moore Blvd.	E. of Pole Line Rd.	57.5 (+1.3)
Donner Ave.	E. of Pole Line Rd.	54.2 (+0.6)
Picasso Ave.	E. of Pole Line Rd.	57.0 (+1.0)

Note: *Each number in parantheses represents the decibel change generated by the Proposed Project, compared with baseline existing conditions.

Source: FHWA-RD-77-108 with inputs from Fehr & Peers and Bollard & Brennan, Inc.

It should also be noted that the Con Agra property is adjacent to the project site on the west. The Con Agra property is the site of the closed Hunt/Wesson tomato cannery. The current zoning for the ConAgra property is Planned Development #1-00, for a range of industrial and business park uses. A discretionary Final Planned Development would have to be approved before any new construction or new uses on the site, requiring a public hearing before the Planning Commission. To allow the construction or use, the Commission would need to find that the use is appropriate in area, location, and overall planning for the purpose intended. Therefore, noise levels associated with any future use of the Con Agra property would not have adverse effects on the Proposed Project. However, as noted above, traffic noise from surrounding roadways would generate ***significant*** exterior noise impacts on project residences.

High Density Alternative

As presented in Table 4.6-6, under the High Density Alternative (without mitigation), traffic noise exposure on the project site would be expected to range from 61.9 to 68.4 dB L_{dn} along Covell Boulevard, F Street, and Pole Line Road.

Table 4.6-6
Predicted Traffic Noise Levels at 75 Feet from Roadway Centerlines - Existing Conditions Plus High Density Alternative

Roadway	Segment	L_{dn}, dB (change, dB)
Covell Blvd.	W. of F Street	65.1 (+1.3)
Covell Blvd.	F Street – J Street	66.0 (+1.9)
Covell Blvd.	J Street – L Street	66.2 (+2.2)
Covell Blvd.	L Street – Pole Line Rd.	65.5 (+1.6)
Covell Blvd.	E. of Pole Line Rd.	63.7 (+1.3)
Pole Line Rd.	N. of Covell Village Rd.	64.4 (NA)
Pole Line Rd.	Covell Village Rd. – Moore Ave.	65.1 (+1.6)
Pole Line Rd.	Moore Ave. – Donner Ave.	66.9 (+2.5)
Pole Line Rd.	Donner Ave. – Picasso Ave.	67.7 (+2.8)
Pole Line Rd.	Picasso Ave. – Covell Blvd.	68.4 (+2.5)
Pole Line Rd.	S. of Covell Blvd.	66.8 (+1.8)
F Street	N. of Covell Blvd.	61.9 (+0.8)
F Street	S. of Covell Blvd.	63.3 (+1.0)
J Street	S. of Covell Blvd.	58.6 (+1.9)
L Street	Covell Blvd. – Drexel Dr.	60.1 (+3.8)
L Street	Drexel Dr. – Eighth Street	60.3 (+3.5)
L Street	S. of Eighth Street	61.0 (+2.6)
Moore Blvd.	E. of Pole Line Rd.	57.7 (+1.5)
Donner Ave.	E. of Pole Line Rd.	54.4 (+0.7)
Picasso Ave.	E. of Pole Line Rd.	57.2 (+1.2)

Source: FHWA-RD-77-108 with inputs from Fehr & Peers and Bollard & Brennan, Inc.

These figures exceed the City of Davis 60 dB L_{dn} exterior noise criterion for outdoor activity areas of residential land uses on project perimeter roadways. Therefore, the impact would be considered ***significant***.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

The following measure is identified for the Proposed Project and the High Density Alternative.

4.6-1 *In conjunction with the submittal of any tentative map application, the project applicant shall provide a detailed acoustical analysis identifying appropriate mitigation measures, including those identified in the October 2004 Environmental Noise Assessment to reduce the exterior noise levels, consistent with City of Davis standards. The analysis shall identify specific, appropriate mitigation measures to reduce the exterior noise levels at property lines, consistent with City of Davis Noise standards. These mitigation measures may include, but are not limited to: use of setbacks; use of barriers; site design guidelines; and building location and orientation guidelines. The mitigation measures shall be incorporated into the site design for the review and approval of the Community Development Director prior to the approval of tentative maps.*

4.6-2 An increase in existing traffic noise levels on surrounding roadways.

Proposed Project

The development of the Proposed Project would result in the addition of 1,515 residential units and various commercial and public uses to the project site, which is currently vacant except for a few ranch buildings. Very few trips are generated by current on-site uses. For this reason, the development would generate substantially increased traffic levels on existing local area roadways. As shown in Table 4.6-5, project-related traffic noise increases on local area roadways would range from 0.8 to 3.3 dB. Specifically, on L Street between Covell Boulevard and Drexel Drive, traffic noise levels are expected to rise by 3.1 dB, relative to existing levels. On L Street between Drexel Drive and Eighth Street, traffic noise levels are expected to rise by 3.3 dB, relative to existing levels. These two segments would exceed the significance criterion of 3 dB established for this project. Residences, which are noise-sensitive uses, exist along or near these two segments of L Street, and would therefore be impacted by the traffic noise increases.

In addition to traffic noise levels, another potential noise source associated with the Proposed Project is the fire station site. It should be noted that the project would not immediately result in the construction of a fire station; rather, the project involves the dedication of a fire station site. Should a fire station be constructed on-site in the future, operations associated with the station would generate noise levels. However, noise levels generated by the station would be intermittent in nature and would not be expected to adversely affect nearby sensitive receptors.

Because the Proposed Project would increase traffic noise levels along portions of L Street, and the noise level increases would exceed applicable thresholds, a ***significant*** impact to existing uses along this segment of L Street would result.

High Density Alternative

The High Density Alternative would result in the construction of an additional 475 net dwelling units on the project site, as compared to the Proposed Project. Therefore, the High Density Alternative would be expected to generate increased traffic on existing local area roadways. Table 4.6-6 shows that, relative to existing levels, High Density Alternative-related traffic noise levels on L Street between Covell Boulevard and Drexel Drive would be expected to increase by 3.8 dB, while traffic noise levels on L Street between Drexel Drive and Eighth Street would increase by 3.5 dB. These increases exceed the 3 dB significance criterion established for this project, and would impact the same noise-sensitive land uses as described above. Therefore, implementation of the High Density Alternative would result in a ***significant*** impact to existing uses along the aforementioned segment of L Street.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level. Because homes along this section of L Street front the roadway and require driveway access, the construction of property-line noise barriers along L Street is not a feasible means of reducing noise levels. Therefore, the *Environmental Noise Analysis* identifies the following method of mitigating project-related traffic noise exposure increases at existing noise-sensitive receiver locations.

The following measures are identified for the Proposed Project and the High Density Alternative.

4.6-2 *In conjunction with the submittal of any tentative map application, the project applicant shall provide to the City of Davis a detailed acoustical analysis, performed by a qualified environmental noise analyst, to establish specific mitigation measures for noise impacts to the segment of L Street between Covell Boulevard and Eighth Street. These mitigation measures may include, but are not limited to, use of noise-reducing paving materials such as rubberized asphalt. The mitigation measures shall be a requirements of the tentative map, subject to review and approval of the Community Development Director prior to the approval of tentative maps.*

4.6-3 California Northern Railroad noise levels on the project site.

Proposed Project

The CNRR tracks lie directly adjacent to the project site along approximately 3,000 feet of the project site's western boundary. Long-term (48-hours) noise measurements of existing railroad noise at Measurement Site 4, approximately 55 feet from the centerline of the tracks, showed an average of three daytime operations (i.e. train passages) and zero nighttime operations during the

measurement period. The average measured train SEL was recorded to be approximately 99 dB at 55 feet, and the calculated noise exposure from train events at this measurement site is approximately 54 dB L_{dn}.

According to the *Environmental Noise Analysis*, rail operations on this section of track are not expected to increase significantly within the foreseeable future, and future noise exposure from this source on the project site is not expected to exceed 54 dB L_{dn} under the Proposed Project. Because this noise level does not exceed the established 60 dB L_{dn} exterior noise criterion for outdoor activity areas of residential land uses, the impact of rail operations would be considered ***less-than-significant*** with implementation of the Proposed Project.

High Density Alternative
As noted above, future noise exposure from rail operations adjacent to the project site is not expected to exceed 54 dB L_{dn}, which is within the 60 dB L_{dn} exterior noise criterion. Therefore, rail-associated noise impacts under the High Density Alternative would be considered ***less-than-significant***.

Mitigation Measure(s)
None Required.

4.6-4 Blue Max Kart Club noise levels on the project site.

Proposed Project
The Blue Max Kart Club racetrack is located directly north of the northeastern corner of the project site. Long-term noise measurements of typical Blue Max Kart Club activities at Measurement Site 1, approximately 125 feet from the center of the go-cart track, yielded an average measured noise exposure of approximately 62 dB L_{dn} and approximately 71 dB L_{eq}. These levels exceed the current exterior noise exposure criteria of 55 dB for stationary noise sources under the City of Davis Noise Ordinance. Based on the detailed measurement results, this exposure is primarily due to activities on the go-cart track, with only minor contribution from traffic on Pole Line Road. Because typical activities at the Club are not expected to change in the future, unmitigated noise exposure on the project site is not expected to exceed the measured value of 62 dB L_{dn} and 71 dB L_{eq}. However, worst-case operations times, such as race weekends and other special events, would likely produce higher noise levels on the project site.

Possible mitigation measures identified by Bollard & Brennan to address residential noise impacts include the use of setbacks and barriers, as well as appropriate site design, building locations, and building orientations. These measures are described in detail under Impact 4.6-1. For residences in the vicinity of the Blue Max Kart Track, Bollard & Brennan estimates that a property line noise barrier of no less than approximately 12 feet in height would be needed in order to provide the 16 dB of noise level reduction required to meet the City's daytime Noise Ordinance criterion.

As described above, average existing (and expected future) noise exposure from the Blue Max Kart Club is expected to be approximately 62 dB L_{dn}, and approximately 71 dB L_{eq}, at the closest proposed locations of outdoor activity areas on the project site. This level exceeds both the established General Plan Noise Element 60 dB L_{dn} exterior noise criterion and the City Noise Ordinance 55 dB noise exposure criterion. In addition, it is expected that worst-case noise activities at the facility would be much higher than measured. Therefore, this impact would be considered ***significant***.

High Density Alternative

The High Density Alternative would result in a net increase of 475 units over those included in the Proposed Project. However, according to the *Environmental Noise Analysis*, Blue Max Kart Club noise impacts for the High Density Alternative are projected to be the same as for the Proposed Project scenario. Therefore, the impact would be considered ***significant***.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

The following measures are identified for the Proposed Project and the High Density Alternative.

4.6-4 *In conjunction with the submittal of any tentative map application, the project applicant shall submit a detailed acoustical analysis, which shall include the recommendations in the October 2004 Environmental Noise Analysis, for residences on the project site which would be located inside of the 55 dB noise contours as stated in the City of Davis Noise Ordinance. The analysis shall specifically address worst-case scenario noise activities at the Blue Max Kart Club and identify specific, appropriate mitigation measures to reduce the exterior and interior noise levels at property lines in the vicinity of the Kart Club, to the maximum extent feasible as determined by the City Engineer. These mitigation measures may include, but are not limited to: use of setbacks; use of barriers; site design guidelines; building location and orientation guidelines; use of double-pane windows; and use of modern ventilation systems. The mitigation measures shall be incorporated into the site design for the review and approval of the Community Development Director.*

4.6-5 Short-term noise impacts from construction activities.

Proposed Project

Activities associated with project construction would result in elevated noise levels, with maximum noise levels ranging from 85-88 dB at 50 feet, as shown in

Table 4.6-4. Although these levels would be audible at the nearest existing residences, they 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 to be ***significant***.

High Density Alternative

As with the Proposed Project, implementation of the High Density Alternative would require construction activities on the site which would result in elevated ambient noise levels for the duration of the construction period. In addition, because this alternative would add a substantially greater number of dwelling units than would the Proposed Project, the duration and volume of noise generated would be expected to be greater. Therefore, the impact would be considered ***significant***.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

The following measures are identified for the Proposed Project and the High Density Alternative.

4.6-5 *Compliance with the following measures shall be incorporated within the Final Planned Development with specific criteria and standards to be reviewed and approved by the Planning Commission:*

- *Construction activities shall be scheduled to occur during normal daytime working hours, i.e. 7:00 AM to 9:00 PM. These criteria shall be included in the improvement plans prior to initiation of construction. Exceptions to allow expanded construction activity hours shall be reviewed on a case-by-case basis as determined by the Community Development Director.*
- *All heavy construction equipment and all stationary noise sources (such as diesel generators) shall be fitted with factory-specified mufflers***.**
- *Equipment warm up areas, water tanks, and equipment storage areas shall be located in an area as far away from existing residences as is feasible.*

Cumulative Impacts and Mitigation Measures

4.6-6 Cumulative impacts of off-site traffic on on-site noise-sensitive uses.

Proposed Project

According to Table 4.6-7, traffic noise generated by the Cumulative (2015) Plus Proposed Project scenario, if unmitigated, would exceed the City of Davis 60 dB L_{dn} exterior noise criterion for outdoor activity areas of residential land uses. As projected by Bollard & Brennan, noise levels could range from 62.5 to 68.5 dB L_{dn} along Covell Boulevard, F Street, and Pole Line Road. Cumulative impacts generated by the proposed project are expected to be less than impacts generated by the Proposed Project with existing conditions because the baseline of noise under cumulative conditions is higher than noise under existing conditions; traffic is expected to be heavier in cumulative conditions, thereby generating more noise, than existing traffic.

In addition, according to the Noise Report, Cumulative (2015) Plus Project traffic noise exposure levels may exceed the 45 dB L_{dn} interior noise standard within proposed dwellings. Effective noise attenuation measures commonly utilized to reduce interior noise levels pertain to building design. For example, Proposed Project buildings closest to the perimeter noise sources may be designed to minimize exterior-to-interior noise transmission, thus minimizing interior noise exposure, by 1) limiting the area of acoustically weak building elements (i.e., windows and doors) in the exterior building façade design, and 2) providing acoustically rated windows and doors at the most highly noise-impacted building façades.

Because traffic noise generated by the Proposed Project in combination with traffic noise generated by other developments could exceed City of Davis interior and exterior noise standards for planned residences on the project site, the cumulative impact would be considered ***significant***.

Table 4.6-7
Predicted Traffic Noise Levels at 75 Feet from Roadway Centerlines - Cumulative (2015) Plus Proposed Project

Roadway	Segment	L_{dn}, dB (change, dB)
Covell Blvd.	W. of F Street	65.7 (+0.8)* **
Covell Blvd.	F Street – J Street	66.7 (+1.1)
Covell Blvd.	J Street – L Street	66.7 (+1.3)
Covell Blvd.	L Street – Pole Line Rd.	66.3 (+0.9)
Covell Blvd.	E. of Pole Line Rd.	65.0 (+0.7)
Pole Line Rd.	N. of Covell Village Rd.	65.5 (NA)
Pole Line Rd.	Covell Village Rd. – Moore Ave.	65.6 (+0.9)
Pole Line Rd.	Moore Ave. – Donner Ave.	67.4 (+1.4)
Pole Line Rd.	Donner Ave. – Picasso Ave.	68.0 (+1.6)
Pole Line Rd.	Picasso Ave. – Covell Blvd.	68.5 (+1.5)
Pole Line Rd.	S. of Covell Blvd.	67.5 (+1.1)
F Street	N. of Covell Blvd.	62.5 (+0.6)
F Street	S. of Covell Blvd.	63.9 (+0.6)
J Street	S. of Covell Blvd.	59.2 (+0.8)
L Street	Covell Blvd. – Drexel Dr.	59.8 (+2.8)
L Street	Drexel Dr. – Eighth Street	60.6 (+2.2)
L Street	S. of Eighth Street	60.6 (+2.2)
Moore Blvd.	E. of Pole Line Rd.	59.4 (+0.8)
Donner Ave.	E. of Pole Line Rd.	54.5 (+0.6)
Picasso Ave.	E. of Pole Line Rd.	57.2 (+1.0)

Note: *Each number in parantheses represents the decibel change generated by the Proposed Project compared with baseline cumulative conditions.

** The change in decibel levels is lower with cumulative plus Proposed Project conditions than with existing plus Proposed Project conditions because the baseline of noise under cumulative conditions is higher (more traffic is expected to be present in 2015).

Source: FHWA-RD-77-108 with inputs from Fehr & Peers and Bollard & Brennan, Inc.

High Density Alternative

As presented in Table 4.6-8, under the High Density Alternative (without mitigation), traffic noise exposure on the project site would be expected to range from 62.7 to 69 dB L_{dn} along Covell Boulevard, F Street, and Pole Line Road. These noise levels would exceed the City of Davis exterior noise thresholds.

In addition, traffic noise exposure levels may exceed the 45 dB L_{dn} interior noise standard under the Cumulative (2015) Plus High Density Alternative scenario. Therefore, traffic generated by the High Density Alternative in addition to traffic generated by other developments would have a ***significant*** cumulative exterior and interior noise impact to proposed residences.

Table 4.6-8
Predicted Traffic Noise Levels at 75 Feet from Roadway Centerlines - Cumulative (2015) Plus High Density Alternative

Roadway	Segment	L_{dn}, dB (change, dB)
Covell Blvd.	W. of F Street	65.9 (+1.0)
Covell Blvd.	F Street – J Street	66.9 (+1.3)
Covell Blvd.	J Street – L Street	67.0 (+1.6)
Covell Blvd.	L Street – Pole Line Rd.	66.5 (+1.1)
Covell Blvd.	E. of Pole Line Rd.	65.1 (+0.8)
Pole Line Rd.	N. of Covell Village Rd.	65.6 (NA)
Pole Line Rd.	Covell Village Rd. – Moore Ave.	65.9 (+1.2)
Pole Line Rd.	Moore Ave. – Donner Ave.	67.7 (+1.8)
Pole Line Rd.	Donner Ave. – Picasso Ave.	68.4 (+2.0)
Pole Line Rd.	Picasso Ave. – Covell Blvd.	69.0 (+1.9)
Pole Line Rd.	S. of Covell Blvd.	67.7 (+1.3)
F Street	N. of Covell Blvd.	62.7 (+0.8)
F Street	S. of Covell Blvd.	64.0 (+0.7)
J Street	S. of Covell Blvd.	59.4 (+1.0)
L Street	Covell Blvd. – Drexel Dr.	60.3 (+3.2)
L Street	Drexel Dr. – Eighth Street	60.9 (+2.6)
L Street	S. of Eighth Street	61.0 (+2.6)
Moore Blvd.	E. of Pole Line Rd.	59.5 (+0.9)
Donner Ave.	E. of Pole Line Rd.	54.6 (+0.7)
Picasso Ave.	E. of Pole Line Rd.	57.3 (+1.2)

Source: FHWA-RD-77-108 with inputs from Fehr & Peers and Bollard & Brennan, Inc.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

The following measures are identified for the Proposed Project and the High Density Alternative.

4.6-6(a) *Implement Mitigation Measure 4.6-1.*

4.6-6(b) *In conjunction with the submittal of a tentative map application that identifies proposed residences on the project site which would have interior noise levels exceeding 45 dB L_{dn},, the project applicant shall provide a detailed acoustical analysis identifying appropriate mitigation measures to reduce the interior noise levels, consistent with City of Davis standards. These mitigation measures may include, but are not limited to, providing acoustically rated windows and doors at the most highly noise-impacted building façades. The mitigation measures shall be*

incorporated into the site design for the review and approval of the Community Development Director prior to the approval of tentative maps.

4.6-7 Long-term traffic noise impacts to surrounding roadways from the proposed project, in combination with existing and future developments in the Davis area.

Proposed Project
In combination with other existing and future developments in and near the City of Davis, the Proposed Project would contribute to increases in long-term cumulative traffic noise levels on the local roadway network.

Table 4.6-7 shows that Cumulative (2015) Plus Proposed Project traffic noise levels, relative to Cumulative (2015) No Project noise levels,[3] are not expected to exceed the 3 dB significance criterion. Therefore, this impact would be considered ***less-than-significant***.

High Density Alternative
The High Density Alternative would create 1,990 residential units on the Covell Village project site, as well as the commercial Village Center, fire station site, and school site. Implementation of this Alternative would therefore generate long-term, cumulative traffic noise level increases on existing local area roadways, in excess of those that would be generated with implementation of the Proposed Project.

Table 4.6-8 shows that under the Cumulative (2015) Plus High Density Alternative scenario, traffic noise levels on L Street between Covell Boulevard and Drexel Drive are expected to increase over Cumulative (2015) No Project noise levels by 3.2 dB. This would exceed the significance criterion established for the project. Therefore, the impact would be considered ***potentially significant***.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

The following measure is identified for the High Density Alternative and not the Proposed Project.

4.6-7 Implement Mitigation Measure 4.6-2.

Endnotes

[1] Bollard & Brennan, Inc. *Environmental Noise Analysis*. October 28, 2004.
[2] *City of Davis General Plan.* May 2001.
[3] No Project noise levels may be derived by subtracting projected noise increases from predicted future levels shown on Tables 4.6-5 through 4.6-8.