APPENDIX K

NOISE IMPACT ASSESSMENT

Environmental Noise Assessment

Vanden Meadows Specific Plan Area

Vacaville, California (Solano County)

BAC Job #2011-011

Prepared For:

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Introduction

This section was prepared by Bollard Acoustical Consultants (BAC) and discusses the existing and projected future noise environments in the Vanden Meadows Specific Plan Area (proposed project), and evaluates potential noise and vibration impacts and mitigation measures due to and upon development within the project area. The proposed project area is shown in Figure 1. Figure 2 shows the proposed land use plan.

Environmental Setting

Background and Terminology

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 hence 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 in 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 levels (dB) correspond closely to human perception of relative loudness. Definitions of acoustical terminology are provided in Appendix A.

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 L_{eq} is the foundation of the composite noise descriptors, L_{dn} and CNEL, and shows very good correlation with community response to noise.

The Day-night Average Level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10 decibel weighting 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 L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. Where short-term noise sources are an issue, noise impacts may be assessed in terms of maximum noise levels, hourly averages, or other statistical descriptors.

Figure 1

Vanden Meadows Specific Plan EIR - Vacaville, California

Site Vicinity & Ambient Noise Measurement Locations

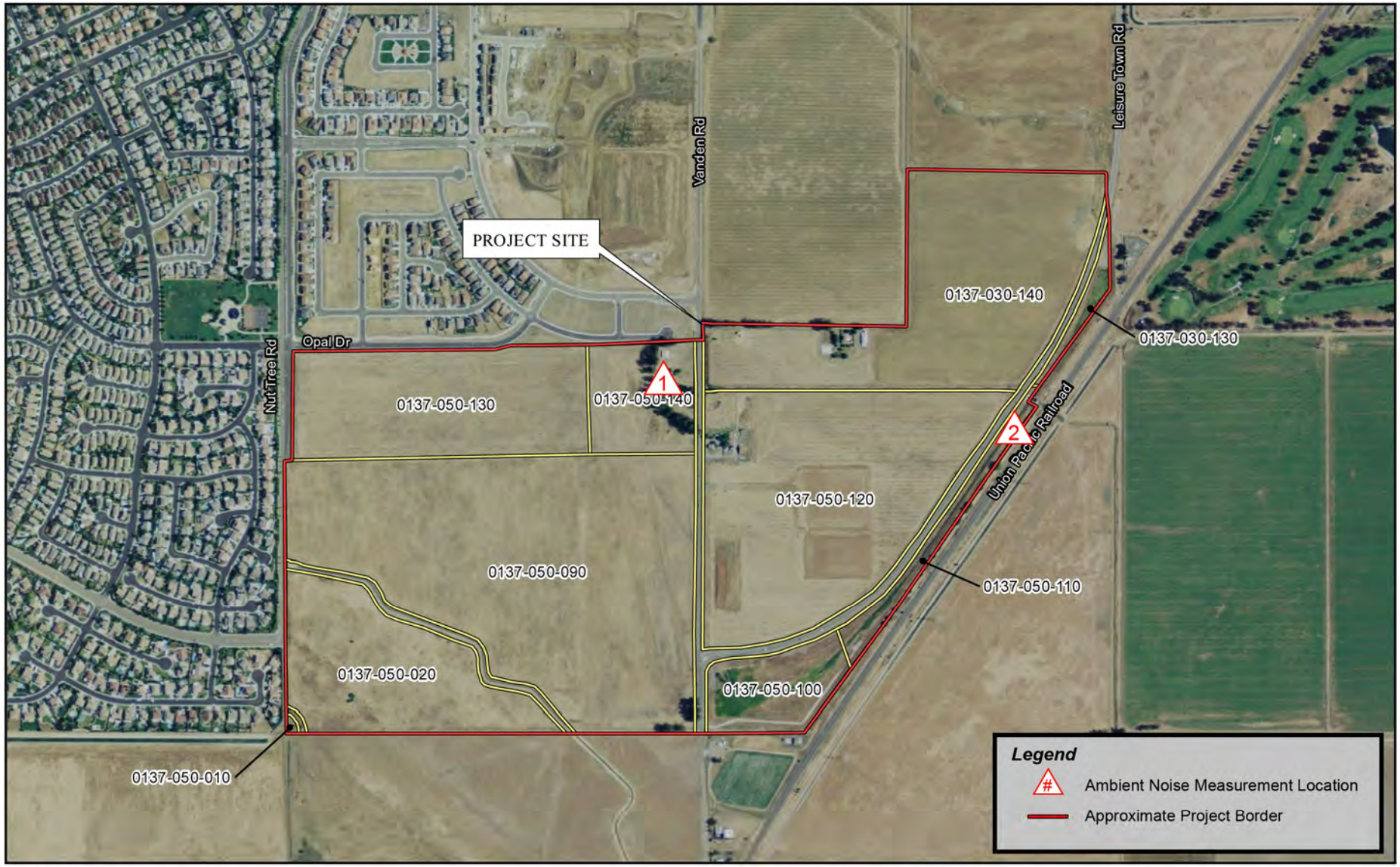
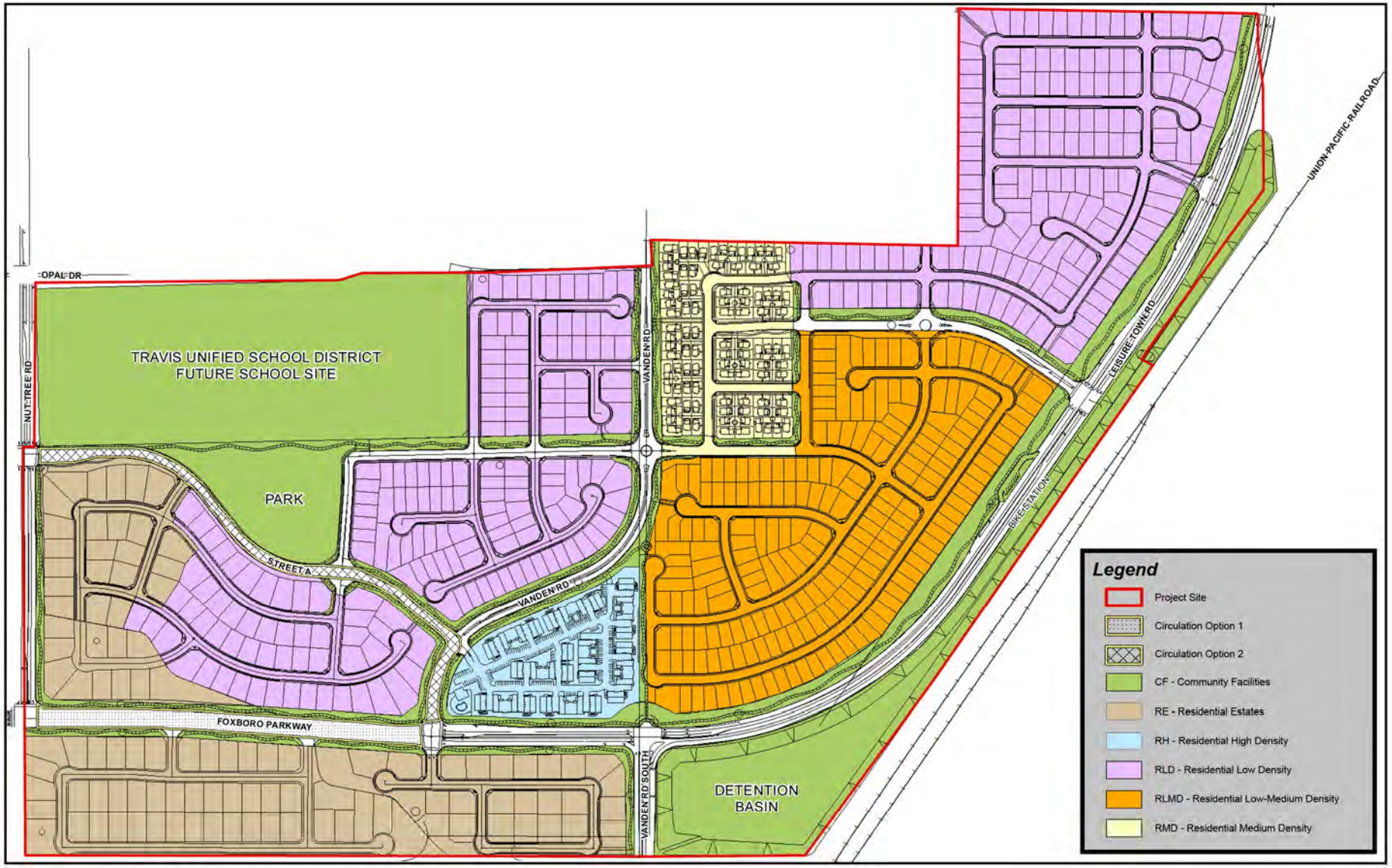


Figure 2

Vanden Meadows Specific Plan EIR - Vacaville, California

Proposed Project Site Plan



Another common descriptor is the community noise equivalency level (CNEL). The CNEL is similar to the L_{dn}, except it has an additional weighting factor. Both average noise energy over a 24-hour period. The CNEL applies a +5 decibel weighting to events that occur between 7:00 p.m. and 10:00 p.m., in addition to the +10 decibel weighting between 10:00 p.m. and 7:00 a.m. associated with L_{dn}. Typically, the CNEL and L_{dn} result in similar results for the same noise events, with the CNEL sometimes resulting in reporting a 1 dB increase compared to the L_{dn} to account for noise events between 7-10 p.m. that have the additional weighting factor.

The perceived loudness of sounds and corresponding reactions to noise are dependent upon many factors, including sound pressure level, duration of intrusive sound, frequency of occurrence, time of occurrence, 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 assessments. All noise levels reported in this section are in terms of A-weighted levels in decibels. Table 1 shows examples of noise levels for several common noise sources and environments.

Table 1

Typical A-Weighted Sound Levels of Common Noise Sources

Loudness Ratio	dBA	Description
128	130	Threshold of pain
64	120	Jet aircraft take-off at 100 feet
32	110	Riveting machine at operators position
16	100	Shotgun at 200 feet
8	90	Bulldozer at 50 feet
4	80	Diesel locomotive at 300 feet
2	70	Commercial jet aircraft interior during flight
1	60	Normal conversation speech at 5-10 feet
1/2	50	Open office background level
1/4	40	Background level within a residence
1/8	30	Soft whisper at 2 feet
1/16	20	Interior of recording studio

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating. Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities (PPV) in inches per second. The vibration velocity, VdB, is a logarithmic scaling of vibration magnitude, and it allows relative measurements to be easily made.

Existing Noise Sources Affecting the Project Area

The existing ambient noise environment in the project vicinity is defined primarily by traffic on the local roadways, frequent Union Pacific Railroad (UPRR) operations, and distant aircraft operations associated with Travis Air Force Base.

A combination of visual and noise level measurement surveys, use of existing acoustical literature, and application of accepted noise prediction methodologies were used to quantify the existing ambient noise environment in the project study area resulting from the identified major noise sources. A separate discussion of the effects of each of these major noise sources on the plan area is included below.

Existing Roadway Traffic Noise Levels

To describe noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The FHWA 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.

Average daily traffic (ADT) volumes were obtained from the traffic study prepared for this project. The FHWA Model inputs and detailed results are contained in Appendices B-D. Table 2 shows the predicted existing traffic noise levels at a reference distance of 100 feet from the roadway centerlines, as well as the distances to the L_{dn} contours. It should be noted that the Table 2 data does not include any shielding which may be present from existing structures or topography. Nor does the Table 2 data include adjustment for atmospheric absorption of sound or excess ground attenuation which, when combined, generally provide an additional noise reduction of 1.5 dB per thousand feet from the roadway. Table 3 provides baseline traffic noise levels (existing plus approved projects), both with and without the roadway extension.

Table 2
Existing Traffic Noise Levels and Contour Distances
Vanden Meadows Project Area Roadways

#	Roadway	Segment Description	L_{dn} @ 100 feet from C/L (dB)	Distance (Feet) 70 dB L_{dn}	65 dB L_{dn}	60 dB L_{dn}
1	Vanden Rd	S of Alamo	59	18	38	82
2	Vanden Rd	N of Foxboro & S of Vanden Meadows Collector	64	41	87	188
3	Vanden Rd	S of Foxboro (also Jepson Pkwy)	66	54	116	250
4	Alamo Drive	W of Interstate 80 EB Ramps	65	49	106	229
5	Alamo Drive	W of Marshall	66	54	116	251
6	Alamo Drive	W of Peabody	66	57	122	264
7	Alamo Drive	W of Nut Tree	66	51	110	236
8	Alamo Drive	W of Vanden	65	49	105	227
9	Alamo Drive	W of Leisure Town	61	27	57	123
10	Leisure Town Rd	N of EB Ramps	66	57	122	264
11	Leisure Town	N of Orange	67	60	129	278
12	Leisure Town	N of Sequoia	66	52	112	240
13	Leisure Town Rd	N of Elmira	66	55	117	253
14	Leisure Town Rd	N of Alamo	64	41	88	189
15	Leisure Town Rd	S of Alamo	62	30	64	138
16	Leisure Town Rd	E of Foxboro	62	29	62	133
17	Leisure Town Rd	S of Foxboro	65	46	99	213
18	Nut Tree Rd	N of Alamo	65	50	107	231
19	Nut Tree Rd	S of Alamo	64	41	88	189
20	Peabody Rd	N of Alamo	67	61	131	282
21	Peabody Rd	S of Alamo	68	79	170	366
22	Peabody Rd	N of Foxboro	68	74	159	342
23	Peabody Rd	S of Foxboro	68	71	153	330
24	Peabody Rd	N of City Limits	68	75	162	349

Source: Bollard Acoustical Consulting

Table 3
Baseline Traffic Noise Levels with Extension Variations
Vanden Meadows Project Area Roadways

Road	Segment	Ldn @ 100 Feet Exist + AP w/Ext	Exist + AP w/o Ext.	Exist + AP + P w/ Ext	Exist + AP + P w/o Ext
Vanden Rd	S of Alamo	57	58	58	58
Vanden Rd	N of Park	55	56	56	56
Vanden Rd	S of Park	53	59	54	54
Vanden Rd	N of Foxboro & S of Vanden Meadows Collector	59	65	62	66
Vanden Rd	S of Foxboro (also Jepson Pkwy)	67	67	67	67
Vanden Rd	Realigned with Project	n/a	n/a	49	49
Alamo Drive	W of Interstate 80 EB Ramps	66	65	66	66
Alamo Drive	W of Marshall	67	67	67	67
Alamo Drive	W of Peabody	67	68	68	68
Alamo Drive	W of Nut Tree	67	66	67	67
Alamo Drive	W of Vanden	63	64	64	64
Alamo Drive	W of Leisure Town	61	61	61	61
Leisure Town Rd	N of EB Ramps	69	69	69	69
Leisure Town Rd	N of Orange	68	68	68	68
Leisure Town Rd	N of Sequoia	67	67	64	67
Leisure Town Rd	N of Elmira	63	65	64	64
Leisure Town Rd	N of Alamo	64	65	64	64
Leisure Town Rd	S of Alamo	64	65	65	64
Leisure Town Rd	N of Vanden Meadows Collector	n/a	n/a	63	62
Leisure Town Rd	S of Vanden Meadows Collector	n/a	n/a	62	62
Leisure Town Rd	E of Foxboro	61	63	62	62
Leisure Town Rd	S of Foxboro	66	66	66	66
Nut Tree Rd	N of Alamo	68	65	66	66
Nut Tree Rd	S of Alamo	69	65	66	67
Nut Tree Rd	N of Opal	62	56	64	64
Nut Tree Rd	N of Vanden Meadows Collector	n/a	n/a	62	63
Nut Tree Rd	S of Vanden Meadows Collector	n/a	n/a	61	53
Nut Tree Rd	N of Foxboro	61	n/a	61	53
Peabody Rd	North of Alamo	68	68	68	68
Peabody Rd	S of Alamo	70	70	70	70
Peabody Rd	N of Foxboro	70	70	70	70
Peabody Rd	S of Foxboro	69	69	69	69
Peabody Rd	N of City Limits	69	69	69	69
Foxboro Parkway	West of Nut Tree	69	n/a	61	54
Foxboro Parkway	East of Nut Tree	64	n/a	65	n/a
Foxboro Parkway	W of Vanden Meadows Collector	n/a	n/a	64	n/a
Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	n/a	n/a	65	65

Sources: Bollard Acoustical Consultants, Inc., FHWA RD-77-108

Existing Railroad Noise Levels

The UPRR tracks run northeast to southwest along the southeast border of the project area, as shown in Figure 2. To quantify railroad noise levels on the project site, BAC conducted noise level measurements near the project site on July 12-13, 2011. The railroad noise measurement location is shown on Figure 1.

The sound level meter was programmed to collect single event noise level data during train pass-bys. The single event noise level data indicated that the typical train operation resulted in an average sound exposure level (SEL) of 95 dB at a distance of 75 feet from the railroad track centerline.

During the 24-hour continuous railroad noise measurement survey, a total of 51 apparent railroad events were logged. The measured railroad noise levels were used to predict railroad noise exposure at the project site, with the results of those predictions contained in Table 4. Table 4 contains the distances to the 60, 65 and 70 dB L_{dn}, and 95 dB SEL contours. The significance of the 95 dB SEL contour is provided later, as it relates to the assessment of sleep disturbance impacts during nighttime railroad events. The L_{dn} and SEL values were computed at a distance of 300 feet because that is the approximate distance from the railroad tracks to the nearest proposed residences within the project area.

Table 4
Existing Union Pacific Railroad Noise Levels
Vanden Meadows Project Area

Distance to Noise Contours (feet)*					
60 dB L_{dn}	**65 dB L_{dn}**	**70 dB L_{dn}**	**95 dB SEL**	**Predicted L_{dn} at 300 feet (dB)**	**Predicted SEL at 300 feet (dB)**
503	233	108	172	63	87

Notes:
*Predicted distances to noise level contours are from the railroad track centerline. Distances to contours were predicted assuming a 4.5 dB decrease for each doubling of distance and an additional attenuation rate of 1.5 dB per thousand feet for atmospheric absorption and excess ground attenuation.
Source: Bollard Acoustical Consultants, Inc 2011.

Railroad Vibration Levels

The only identified source of potentially significant vibration levels at the project site was the UPRR tracks located east of the project site. To quantify railroad vibration levels, BAC utilized vibration measurement data of 5 train passages previously collected by BAC staff at other locations. Specifically, vibration measurement data consisting of peak particle velocity sampling at a distance of approximately 110 feet from similar railroad tracks was used to assess vibration levels at the Vanden Meadows site. The train passages consisted of five freight trains. The trains ranged from 2 to 5 locomotives and from 34 to 84 cars.

The measurements were conducted using a Larson-Davis Laboratories Model HVM-100 Vibration Analyzer with a PCB Electronics Model 353B51 ICP Vibration Transducer. The test system is a Type I instrument designed for use in assessing vibration as perceived by human beings, and meets the full requirements of ISO 8041:1990(E). Atmospheric conditions present during the tests were within the operating parameters of the instrument. The results of the vibration measurements are shown in Table 5.

Table 5
Measured Railroad Vibration Levels 110 feet from Railroad Tracks

Time	Event Duration	# Engines	# Cars	Peak Vibration (in/sec)
8:09	1:18	3	60	0.015
10:01	1:28	2	80	0.012
10:13	1:38	2	84	0.009
10:29	1:31	5	80	0.013
10:45	:53	2	34	0.014
8:09	1:18	3	60	0.015

Source: Bollard Acoustical Consultants, Inc. 2008

Aircraft Noise

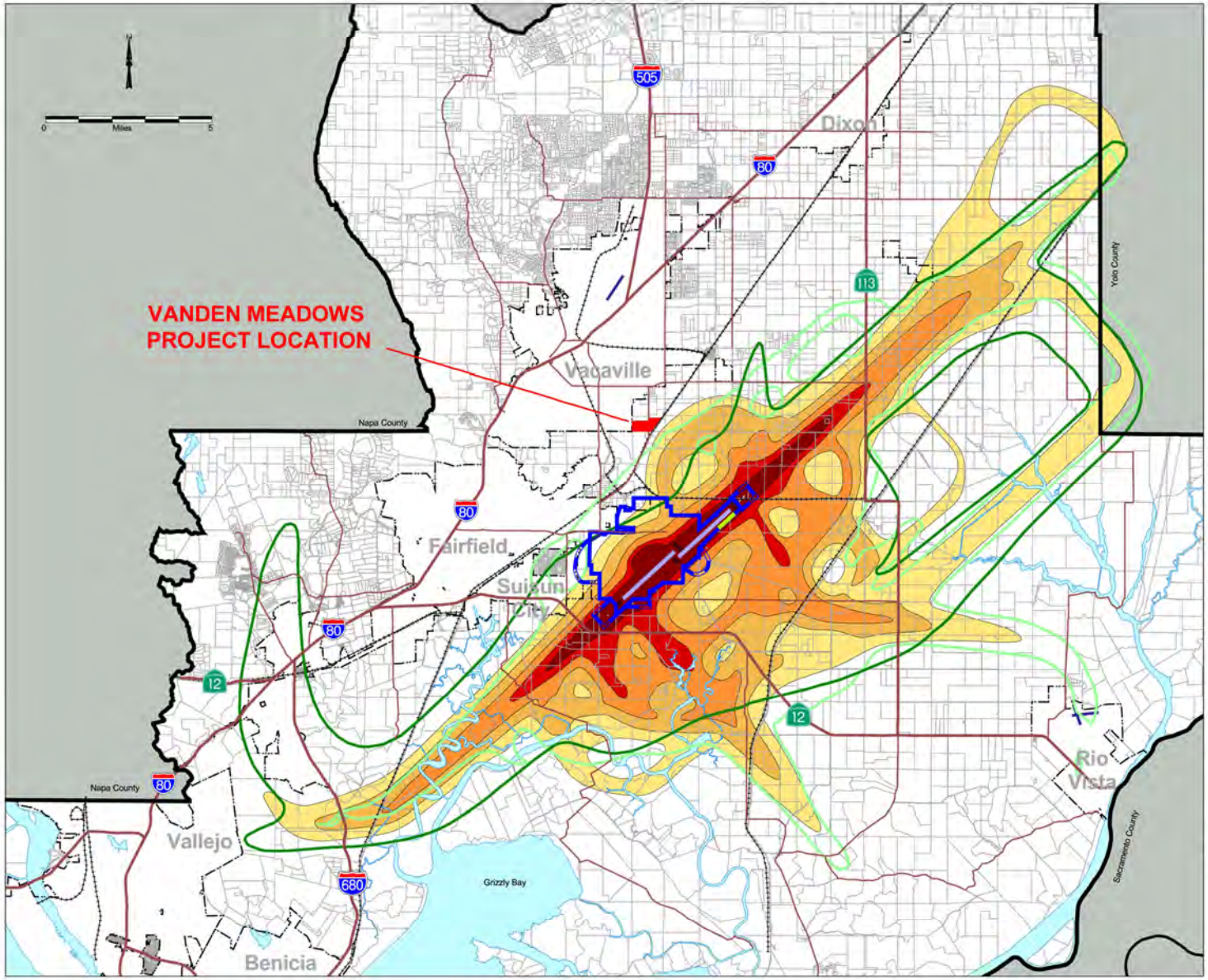
Travis Air Force Base is located approximated 3.5 miles south of the project site. The Travis Air Force Base Land Use Compatibility Plan (adopted by Solano County Airport Land Use Commission on June 13, 2002) provides predicted future noise contours for aircraft operations at Travis Air Force Base. The contours represent a possible future scenario of operations at Travis Air Force base. The future scenario includes a potential doubling of the 2000 aircraft operations level (approximately 127,000 total annual operations).

The project location is depicted relative to the future Travis Air Force Base aircraft noise contours, presented as Figure 3. As shown in Figure 3, the project site lies outside of the 60 dB CNEL contours.

Regarding single-event noise associated with aircraft overflights BAC staff observed very low noise levels during the field inspection. In addition, the single-event noise measurement program conducted for this project indicated that SEL values associated with aircraft operations at Travis were well below 80 dB SEL on the project site.

Figure 3

Travis Air Force Base Noise Contours



Legend

Noise Levels
- 1989 AICUZ - 60 CNEL
- 1995 AICUZ - 60 CNEL, Maximum Mission

2002 Compatibility Plan
- 60 - 65 CNEL
- 65 - 70 CNEL
- 70 - 75 CNEL
- 75 - 80 CNEL
- 80+ CNEL

Travis Air Force Base
- Runways - Existing
- Potential Future Assault Strip
- Property Line
- Easement

Other Features
- Runways of Other Airports
- Roads
- Major Highways
- Railroads
- City Limits
- Parcel Lines

Notes

The noise contours depicted here were created for the purposes of land use compatibility planning. The contours represent a possible future scenario of operations at Travis AFB.

Assumptions include:
- Doubling of the 2000 aircraft operations level (approx. 127,000 total annual operations).
- Redistribution of operations onto the 1995 Maximum Mission flight tracks.
- Addition of C-17 Wing with an assault landing strip southeast of Runway 3R-21L.
- Establishment of an air cargo hub (modeled after the FedEx hub at Oakland International).

Solano County
Airport Land Use Commission

Travis Air Force Base
Land Use Compatibility Plan
(June 13, 2002)

- **Solano County Department of Environmental Management**
- **Harris Miller Miller & Hanson Inc.**
- **Shutt Moen Associates**

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Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

No Federal plans, policies, regulations, or laws related to noise are applicable to the project. The environmental review of Federal projects generally defers to State, county, or other local guidelines. Vibration guidelines from the Federal Transit Administration are discussed below as a means to guide the consideration of vibration impacts.

U.S. Department of Transportation, Federal Transit Administration

To address the human response to groundborne vibration, the Federal Transit Administration of the U.S. Department of Transportation has set forth guidelines for maximum-acceptable vibration criteria for different types of land uses. These criteria include 65 VdB for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-tech manufacturing, and laboratory facilities), 80 VdB for residential uses and buildings where people normally sleep, and 83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, and offices) (FTA 2006).

Standards have also been established to address the potential for groundborne vibration to cause structural damage to buildings. These standards were developed by the Committee of Hearing, Bio Acoustics, and Bio Mechanics (CHABA) at the request of the U.S. Environmental Protection Agency (FTA 2006). For fragile structures, CHABA recommends a maximum limit of 0.25 in/sec PPV (FTA 2006).

State Plans, Policies, Regulations, and Laws

Governor's Office of Planning and Research

The Governor's Office of Planning and Research (OPR) published the *State of California General Plan Guidelines* (OPR 2003), which provides guidance for the acceptability of projects within specific day-night average noise level (L_{dn}) contours. Table 6 summarizes acceptable and unacceptable community noise exposure limits for various land use categories.

Table 6
State Noise-Compatibility Guidelines by Land-Use Category

Land-Use Category	Community Noise Exposure (CNEL/L_{dn}, dBA)			
	Normally Acceptable [a]	Conditionally Acceptable [b]	Normally Unacceptable [c]	Clearly Unacceptable [d]
Residential — Low-Density Single-Family, Duplexes, Mobile Homes	< 60	55–70	70–75	75+
Residential — Multifamily	< 65	60–70	70–75	75+
Transient Lodging — Motels, Hotels	< 65	60–70	70–80	80+
Schools, Libraries, Churches, Hospitals, Nursing Homes	< 70	60–70	70–80	80+
Auditoriums, Concert Halls, Amphitheaters		< 70	65+	
Sports Arenas, Outdoor Spectator Sports		< 75	70+	
Playgrounds, Neighborhood Parks	< 70		68–75	72.5+
Golf Courses, Riding Stables, Water Recreation, Cemeteries	< 75		70–80	80+
Office Buildings, Businesses, Commercial and Professional	< 70	68–78	75+	
Industrial, Manufacturing, Utilities, Agriculture	< 75	70–80	75+	

Source: OPR

Notes:

[a] Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special noise-insulation requirements.

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

[c] New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise-reduction requirements must be made and needed noise-insulation features included in the design. Outdoor areas must be shielded.

[d] New construction or development should generally not be undertaken.

Generally, residential uses (e.g., mobile homes) are considered to be acceptable in areas where exterior noise levels do not exceed 60 dBA L_{dn} (or CNEL). Residential uses are normally unacceptable in areas exceeding 70 dBA L_{dn} and conditionally acceptable within 55–70 dBA L_{dn}. Schools are normally acceptable in areas up to 70 dBA L_{dn} and normally unacceptable in areas exceeding 70 dBA L_{dn}. Commercial uses are normally acceptable in areas up to 70 dBA CNEL. Between 67.5 and 77.5 dBA L_{dn}, commercial uses are conditionally acceptable, depending on the noise insulation features and the noise reduction requirements. The guidelines also present adjustment factors that may be used to arrive at noise-acceptability standards that reflect the noise-control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise issues.

California Department of Transportation

For the protection of fragile, historic, and residential structures, Caltrans recommends a more conservative threshold of 0.2 in/secPPV for normal residential buildings and 0.08 in/sec PPV for old or historically significant structures (Caltrans 2002). These standards are more stringent than the Federal standard established by CHABA, presented above.

Regional and Local Plans, Policies, Regulations, and Ordinances

City of Vacaville General Plan

The City of Vacaville General Plan Noise Element contains noise policies and standards (e.g., exterior and interior noise level performance standards for new projects affected by or including non-transportation noise sources, and maximum allowable noise exposure levels for transportation noise sources).

Policy 10.6-G 1: Require new residential projects and outdoor activity areas in lodging, hospital and nursing/convalescent home projects to meet acceptable exterior noise level standards as shown in Tables 7, 8, and 9 of this document; discourage residential areas from directly abutting Interstate 80 or 505.

Policy 10.6-G 3: Ensure that noise does not exceed interior noise levels of 45 DNL for residential, transient lodging, hospital and nursing/convalescent structures from transportation or fixed-point noise sources.

Policy 10.6-G 4: Minimize vehicular noise sources and noise emanating from transportation activities; control noise at its source to maintain existing noise levels, and in no case exceed acceptable noise levels as established in the Noise and Land Use Compatibility Guidelines reproduced in Table 7 and 8 of this document.

Policy 10.6-G 9: Noise created by transportation noise sources shall be mitigated so as not to exceed the interior and exterior noise level standards shown in Table 7 and 8 of this document.

Policy 10.6-G 10: Noise created by non-transportation noise sources shall be mitigated so as not to exceed the interior and exterior noise level standards of Table 9 of this document.

Policy 10.6-G 12: New residential land uses shall be precluded where the exterior noise associated with aircraft operations at Nut Tree Airport or Travis Air Force Base exceeds 60 dB CNEL.

Table 7

Noise & Land Use Compatibility Policy For Transportation Sources[1]

See next page for airport/land use noise compatibility criteria

Community Noise Exposure
Unmitigated Day/Night Average Noise Level (DNL) in Decibels (dB)

Land Use Category	Noise standard (DNL)		Noise contour
	Interior	Exterior	40 45 50 55 60 65 70 75 80
Residential	45	60[2]	
Transient Lodging Motels, Hotels	45	--[3]	
Hospitals, Nursing Homes	45	60[4]	
Other uses[5]	--	--	

normally acceptable with typical conditions of approval (setbacks, walls, fences and standard building practices).

conditionally acceptable - subject to noise study to demonstrate noise can be reduced to normally acceptable levels with acceptable mitigation.

normally unacceptable - regardless of measures implemented to reduce noise.

Footnotes for Table 10-1

1. This table establishes the maximum transportation noise levels that persons should be exposed to and helps determine the type of review necessary when land uses are proposed within existing noise contours. For the purposes of the Noise Element, transportation noise sources are defined as traffic on public roadways, railroad line operations and aircraft in flight.
2. In multi-family/attached unit projects, applies to courtyards, patios, private areas and activity areas.
3. Areas designed for outdoor activity should be located away from noise sources.
4. Applies to courtyards, patios, private areas and activity areas.
5. Other uses are subject to federal and state OSHA noise exposure standards.

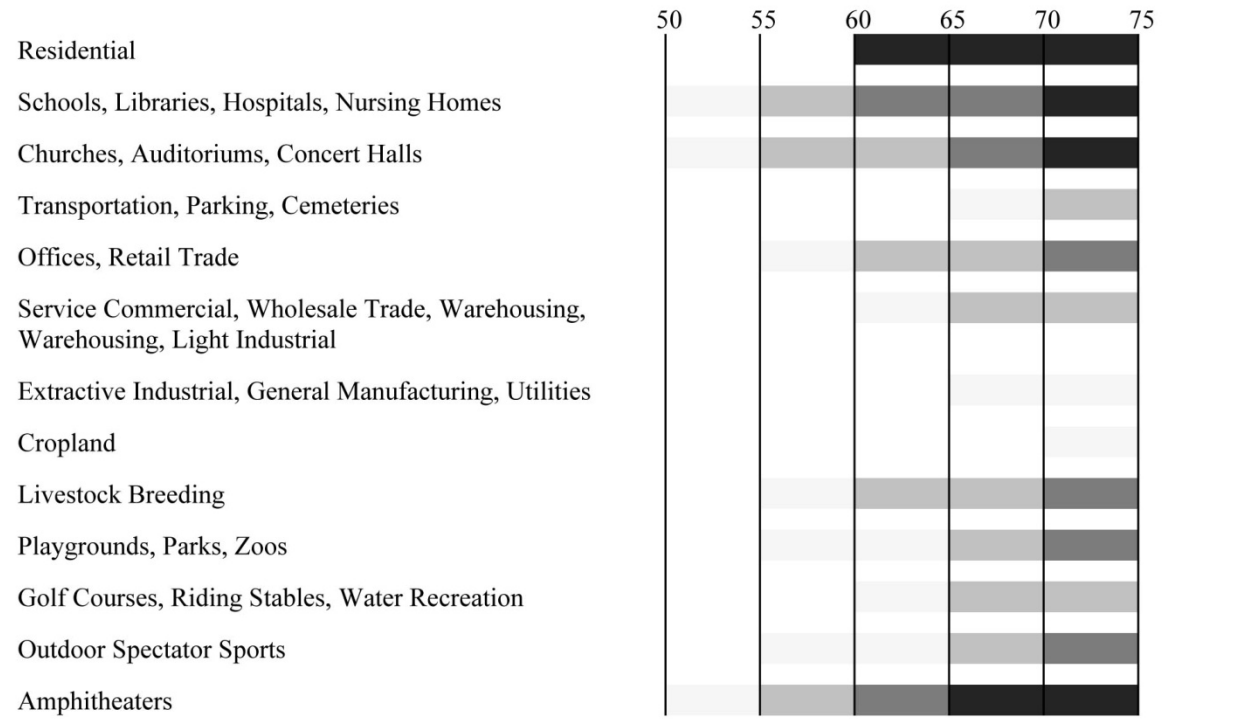
(Table 10-1 from City of Vacaville General Plan Noise Element)

Table 8

Airport/Land Use Noise Compatibility Criteria

As adopted by Solano County Airport Land Use Commission

This table is to be used for aircraft generated noise



CLEARLY ACCEPTABLE
The activities associated with the specified land use can be carried out with essentially no interference from the noise exposure.

NORMALLY ACCEPTABLE
Noise is a factor to be considered in that slight interference with outdoor activities may occur. Conventional construction methods will eliminate most noise intrusions upon indoor activities

MARGINALLY ACCEPTABLE
The indicated noise exposure will cause moderate interference with outdoor activities and with indoor activities when windows are open. The land use is acceptable on the conditions that outdoor activities are minimal and construction features which provide sufficient noise attenuation are used (e.g., installation of air conditioning so that windows can be kept closed). Under other circumstances, the land use should be discouraged.

NORMALLY UNACCEPTABLE
Noise will create substantial interference with both outdoor and indoor activities. Noise intrusion upon indoor activities can be mitigated by requiring special noise insulation construction. Land uses which have conventionally constructed structures and/or involve outdoor activities which would be disrupted by noise should generally be avoided.

CLEARLY UNACCEPTABLE
Unacceptable noise intrusion upon land use activities will occur. Adequate structural noise insulation is not practical under most circumstances. The indicated land use should be avoided unless strong overriding factors prevail and it should be prohibited if outdoor activities are involved

Source: Solano County Airport Land Use Commission, Airport Land Use Compatibility Plan, May 1988 Appendix B

(Table 10-1 from City of Vacaville General Plan Noise Element)

Table 9

Noise & Land Use Compatibility Policy For Non-Transportation Sources[1]

		Exterior Noise Levels[2,3,4,5]		Interior Noise Levels[2,3,4,5]	
Land Use Category	Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Residential	Hourly $L_{eq,}$ dBA	50[6]	45[6]	45	35
	Maximum Level, dBA	70[6]	65[6]	--	--
Transient Lodging	Hourly $L_{eq,}$ dBA	--[7]	--[7]	45	35
Hospital, Nursing Homes	Hourly $L_{eq,}$ dBA	50[8]	45[8]	45	35
Other[9]	Hourly $L_{eq,}$ dBA	--	--	--	--
	Maximum Level, dBA	--	--	--	--

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. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

Footnotes for Table 10-4

1. This table establishes the maximum non-transportation noise levels that persons should be exposed to. For the purposes of the Noise Element, non-transportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, loading docks, construction equipment, etc.
2. Compliance with the noise level standards is to be measured at the affected location of the land use category.
3. If the existing noise levels exceed that of a proposed noise generator, these standards would not be applied to the new noise source unless the additional noise generated would increase the projected, combined noise levels a minimum of three decibels.
4. These standards are applicable to land use determinations and entitlements. They are not applicable for nuisance abatement within residential areas.
5. Exceptions to the standards may be approved for public parks or playgrounds upon a finding that the facility has been designed in a manner that practically limits the noise impact upon other land uses.
6. In multi-family/attached unit projects, applies to courtyards, patios, private areas and activity areas.
7. Areas designed for outdoor activity should be located away from noise sources.
8. Applies to courtyards, patios, private areas and activity areas.
9. Other uses are subject to federal and state OSHA noise exposure standards.

(Table 10-4 from City of Vacaville General Plan Noise Element)

Sleep Interference Criteria for Single Aircraft and Railroad Events

There is currently an on-going discussion regarding the appropriateness of SEL criteria as a supplement or replacement for cumulative noise level metrics such as L_{dn} and CNEL, 24-hour noise descriptors. Because SEL describes a receiver's total noise exposure from a single impulsive event, SELs are often used to characterize noise from aircraft takeoffs and flyovers, as well as noise from individual railroad passages.

The City of Vacaville has not established SEL standards and no definitive, widely-recognized, SEL guidelines currently exist nationwide. To the extent that there is any guidance regarding acceptable SELs, the emphasis has been on physiological effects, not on land use planning (California Division of Aeronautics 2002). For example, the Federal Aviation Administration (FAA) has suggested that the threshold of speech interference is 60 dBA. Exposure to high SELs would result in speech interference at proposed residential dwellings and school facilities. Similarly, the Federal Interagency Committee on Aviation Noise (FICAN) has provided estimates of the percentage of people expected to be awakened when exposed to specific SENLs inside a home (FICAN 1997). However, FICAN did not recommend a threshold of significance based on the percent of people awakened. One agency, the City of Los Angeles, adopted a significance threshold of 10 percent of the population being awakened once every 10 days (i.e., 1 percent of the population was awakened on any one day) for use in the LAX Master Plan EIR/EIS (City of Los Angeles 2004). However, the document specifically cautioned that the threshold was for use in the LAX EIR/EIS only and that the specific environment of LAX was used in the establishment of the thresholds. No other guidance or explanation of the rationale for this highly conservative threshold was provided.

According to the FICAN study, 10% of the population is estimated to be awakened when the SEL interior noise level of 81 dBA. An estimated 5 to 10 percent of the population is affected when the SEL interior noise level is between 64.8 and 81 dBA, and few sleep awakenings (less than 5 percent) are predicted if the interior SEL is less than 64.8 dBA.

The Federal Interagency Committee on Noise (FICON) and the California Airport and Land Use Planning Handbook use CNEL as the primary tool for the purpose of land use compatibility planning (California Division of Aeronautics 2002). In fact, the CNEL represents the cumulative exposure to all aircraft overflights; that is, the exposure of all SELs taken together, weighed to add penalties for evening and nighttime occurrences, and averaged over a 24-hour period. Thus, it can be argued that the Ldn/CNEL standards already account for the individual impacts associated with the SELs.

Due to the distance between proposed noise-sensitive land uses and the flight paths of Travis Air Force Base, it is unlikely that aircraft single-events will have an appreciable effect on the development. However, a portion of the south-eastern project boundary is located near the heavily used railroad tracks. Due to the relatively brief duration of railroad events, and the fact that there are no at-grade crossings in the immediate project vicinity which would require warning horn usage, speech interference during railroad passages is not considered to be a significant issue within either schools or nearby residences. Because there are nighttime train

passages, however, a 70 dB SEL threshold is applied inside residences with windows in the closed position to minimize the potential for sleep disturbance.

Criteria for Assessing Significance of Project-Related Noise Increases

It is generally recognized that an increase of at least 3 dB of similar sources is usually required before most people will perceive a change in noise levels in the community, and an increase of 5 dB is required before the change will be clearly noticeable. A common practice is to assume that a minimally perceptible increase of 3 dB represents a significant increase in ambient noise levels. This approach is very conservative, however, as applied to noise conditions substantially below levels deemed acceptable in general plan noise elements or in ordinances.

Table 10 is based upon recommendations made in August 1992 by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these criteria have been applied to other sources of noise similarly described in terms of cumulative noise exposure metrics such as the L_{dn}. This metric is generally applied to transportation noise sources, and defines noise exposure in terms of average noise exposure during a 24-hour period with a penalty added to noise that occurs during the nighttime.

According to Table 10, an increase in traffic noise levels of 5 dB or more would be noticeable where the ambient level is less than 60 dB, an increase of 3 dB or more would be noticeable where the ambient level is between 60 and 65 dB, and 1.5 dB or more would be noticeable where the ambient noise level exceeds 65 dB L_{dn}. The rationale for the Table 9 criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

Table 10
Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project, L_{dn}	Increase Required for Significant Impact
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

Source: Federal Interagency Committee on Noise (FICON)

Impacts and Mitigation

Analysis Methodology

Predicted traffic, aircraft, and railroad noise levels were compared with applicable standards for determination of significance. Mitigation measures were developed for significant and potentially significant noise impacts.

Aircraft noise levels at the project site were evaluated using the Travis Air Force Base noise contour map reproduced in Figure 3, and single-event noise level data collected at the project site by BAC in 2011.

Railroad noise and vibration exposure at the project site was evaluated using the results of the railroad noise monitoring survey conducted by BAC in 2011 with the results provided in Tables 4 and 5.

Future traffic noise impacts were evaluated by modeling future traffic noise levels for each of the project-area roadways using the FHWA traffic noise prediction model. The results of the future traffic noise modeling process are provided in Table 11.

Table 11
Predicted (2030) Traffic Noise Level and Project-Related Traffic Noise Level Increases With Extension Variations
Vanden Meadows Specific Plan – Vacaville, California

		L_{dn} @ 100 Feet				
Road	Segment	Cum. No Project	Cum. +Proj w/ Ext.	Change	Cum+ Proj w/o Ext..	Change
Vanden Rd.	S of Alamo	58	59	1	59	1
Vanden Rd.	N of Park	51	54	3	54	3
Vanden Rd.	S of Park	50	58	8	58	8
Vanden Rd.	N of Foxboro & S of Vanden Meadows Collector	61	56	-5	57	-4
Vanden Rd.	Foxboro to Proposed City Limits	65	65	0	65	0
Vanden Rd.	S of Proposed City Limits	69	69	0	69	0
Alamo Drive	W of Interstate 80 EB Ramps	67	67	0	67	0
Alamo Drive	W of Marshall	67	67	0	67	0
Alamo Drive	W of Peabody	68	68	0	68	0
Alamo Drive	W of Nut Tree	67	68	1	68	1
Alamo Drive	W of Vanden	66	66	0	66	0
Alamo Drive	W of Leisure Town	65	64	-1	64	-1
Leisure Town Rd.	N of EB Ramps	72	71	-1	72	0
Leisure Town Rd.	N of Orange	72	72	0	72	0
Leisure Town Rd.	N of Sequoia	70	71	1	71	1
Leisure Town Rd.	N of Elmira	69	69	0	69	0
Leisure Town Rd.	N of Alamo	69	69	0	69	0
Leisure Town Rd.	S of Alamo	69	69	0	69	0
Leisure Town Rd.	N of Vanden Meadows Collector	n/a	68	n/a	67	n/a
Leisure Town Rd.	S of Vanden Meadows Collector	n/a	67	n/a	67	n/a
Leisure Town Rd.	E of Foxboro	67	67	0	67	0
Nut Tree Rd.	N of Alamo	66	66	0	66	0
Nut Tree Rd.	S of Alamo	65	66	1	66	1
Nut Tree Rd.	N of Opal	58	62	4	62	4
Nut Tree Rd.	N of Vanden Meadows Collector	n/a	59	n/a	60	n/a
Nut Tree Rd.	S of Vanden Meadows Collector	n/a	57	n/a	50	n/a
Nut Tree Rd.	N of Foxboro	n/a	57	n/a	50	n/a
Peabody Rd.	North of Alamo	68	68	0	68	0
Peabody Rd.	S of Alamo	71	70	-1	70	-1
Peabody Rd.	N of Foxboro	70	70	0	70	0
Peabody Rd.	S of Foxboro	70	70	0	70	0
Peabody Rd.	N of City Limits	70	70	0	70	0
Foxboro Parkway	West of Nut Tree	55	58	3	51	-4
Foxboro Parkway	East of Nut Tree	57	61	4	n/a	n/a
Foxboro Parkway	W of Vanden Meadows Collector	n/a	61	n/a	n/a	n/a
Foxboro Parkway	E of Vanden Meadows Collector	57	62	5	61	4

Sources: Bollard Acoustical Consultants, Inc., FHWA RD-77-108

Thresholds of Significance

The following significance criteria were developed based on guidance provided by the State CEQA Guidelines, and on other Federal, State, and local guidance. Impacts of an alternative on noise would be significant if project implementation would do any of the following:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. A threshold of 0.1 inches per second peak particle velocity (PPV) represents the onset of annoyance and is, therefore, used as the significance threshold in this analysis.

- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. Table 10 identifies project-related noise level increase thresholds of 1.5, 3 and 5 dB as being significant where existing, pre-project, noise levels are greater than 65 dB L_{dn}, between 60 and 65 dB L_{dn}, and less than 60 dB L_{dn}, respectively.

- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. Temporary increases are normally associated with construction related noise, and such activities are normally exempt, and are, thus, less than significant provided they occur during daytime hours.

- Exposure of people residing or working in the area to excessive noise levels from railroad and aircraft, including single event noise incidents that would result in speech interference or disturb sleep. The threshold used herein sleep interference is 70 dB SEL within habitable rooms with windows in the closed positions.

Specific Impact and Mitigation Statements

Impact 1 Exposure of Proposed Residential Outdoor Activity Areas to Railroad Noise

Exterior railroad noise impacts are considered significant where railroad noise levels would exceed the City of Vacaville noise standards shown in Table 7. The Table 4 data indicate that the predicted Ldn value at the nearest proposed residential outdoor activity areas (backyards) within the Vanden Meadows development is 63 dB Ldn. This level exceeds the City of Vacaville 60 dB Ldn exterior noise level standard applicable to residential uses affected by transportation noise sources. As a result, ***this impact is considered significant.***

Mitigation for Impact 1:

MM 1: A solid noise barrier of sufficient height to intercept line of sight between a point 10 feet above the railroad tracks and a backyard receiver 5 feet in height should be constructed along the north side of Leisure Town Road, from the northern site boundary to Vanden Road South, at the locations shown in Figure 4. A barrier that intercepts line of sight between noise source and receiver provides a 5 dB noise reduction. Such a decrease would reduce railroad noise exposure to approximately 58 dB Ldn in the affected residential backyards, which would result in compliance with City of Vacaville Noise standards.

Significance after Mitigation: With implementation of Mitigation Measure 1 noise emanating from UPRR operations would be reduced to levels within the applicable noise standard. As a result, this impact would be **less than significant.**

Impact 2 Exposure of Proposed Residential Interiors to Railroad Noise

Interior railroad noise impacts are considered significant where railroad noise levels would exceed the City of Vacaville 45 dB Ldn interior noise standard shown in Table 7, or where the sound exposure level (SEL) would exceed the recommended sleep interference criterion of 70 dB within residences. These standards are applied with windows in the closed positions.

The Table 4 data indicate that the predicted railroad Ldn value at the nearest residences proposed within the Vanden Meadows development is 63 dB Ldn, and the typical single-event pass-by noise level would be 87 dB SEL. Assuming a minimum building façade noise level reduction of 25 dB for new residential construction, the resulting interior noise levels would be 38 dB Ldn and 62 dB

SEL. Because both of these levels are below the project standards of significance, ***this impact is considered less than significant.***

Mitigation for Impact 2: *None Required*

Impact 3 Exposure of Proposed Residences to Railroad Vibration

The railroad vibration data provided in Table 5 indicates that measured rail vibration levels during passage of freight trains were 0.015 inches per second peak particle velocity or less. The recommended threshold for acceptable vibration levels is 0.1 inches per second. Because the nearest residences in the Vanden Meadows development would be approximately 300 feet from the railroad tracks, projected vibration levels would be even lower than those reported in Table 5 given the additional distance. Because predicted vibration levels are well below the threshold of significance, ***this impact is considered less than significant.***

Mitigation for Impact 3: None Required

Impact 4 Exposure of Exterior Areas of Project Site to Aircraft Noise

Exterior aircraft noise impacts are considered significant where aircraft noise levels would exceed the City of Vacaville noise standards shown in Table 8. According to Figure 3, aircraft noise exposure associated with Travis Air Force Base operations does not exceed 60 dB CNEL at the project site. As a result, the City of Vacaville 60 dB CNEL exterior noise level standard applicable to residential uses affected by aircraft noise will be satisfied, and ***this impact is considered less than significant.***

Mitigation for Impact 4: *None Required*

Impact 5 Exposure of Proposed Residential Interiors to Aircraft Noise

Interior aircraft noise impacts are considered significant where railroad noise levels would exceed the City of Vacaville 45 dB Ldn interior noise standard shown in Table 8, or where single event levels (SEL) would exceed the recommended sleep interference criterion of 70 dB within residences. These standards are applied with windows in the closed positions.

Figure 3 indicates that the predicted aircraft CNEL will be 60 dB or less at the entire development. In addition, measured SEL values for single aircraft events were well below 80 at the project site. Assuming a minimum building façade noise level reduction of 25 dB for new residential construction, the resulting interior noise levels would be 35 dB Ldn and 55 dB SEL. BAC file data for building façade noise reduction indicates that standard construction in

accordance with building code requirements will typically provide 25 dB of exterior to interior noise reduction with windows in the closed position. This level of reduction is based on standard 2x4 stud walls with stucco siding exterior and gypsum board interior surfaces, and fiberglass insulation in the stud cavity. It also assumes standard ½-inch dual pane thermal windows (sound transmission class rating 27), and composition roof. Because the predicted levels are below the project standards of significance, ***this impact is considered less than significant.***

Mitigation for Impact 5: *None Required*

Impact 6 **Exposure of Proposed Residential Outdoor Activity Areas to Future Traffic Noise**

The future traffic noise levels provided in Table 11 indicate that the predicted Ldn values at proposed residential outdoor activity areas (backyards located approximately 100 feet from roadway centerline) within the Vanden Meadows development will exceed 60 dB Ldn. Specifically, future traffic noise levels are predicted to exceed 60 dB Ldn at backyard areas of proposed single-family residential uses and/or common outdoor recreation areas of multi-family residential uses along Leisure Town Road, Vanden Road South, and the Foxboro Parkway extension. As a result, ***this impact is considered significant.***

Mitigation for Impact 6:

MM 6: Solid noise barriers should be constructed along the impacted roadway segments as indicated in Figure 4. A uniform noise barrier height of 8 feet relative to backyard elevations is predicted to reduce future traffic noise levels to 60 dB Ldn within the outdoor activity areas of the residences proposed adjacent to these roadways.

Significance after Mitigation: With implementation of Mitigation Measure 6, future traffic noise levels would be reduced to levels within the applicable noise standard. As a result, this impact would be **less than significant.**

Impact 7 **Exposure of Proposed Residential Interiors to Traffic Noise**

Interior traffic noise impacts are considered significant where traffic noise levels would exceed the City of Vacaville 45 dB Ldn interior noise standard shown in Table 7. This standard is applied with windows in the closed positions.

The Table 11 data indicate that the worst-case predicted traffic Ldn values at residences proposed within the Vanden Meadows development would be 67 dB Ldn or less. At elevated second-floor locations, which would not be shielded by

the recommended noise barriers, reduced ground absorption typically results in a 2 dB increase over first-floor levels. As a result, elevated second-floor residential façade traffic noise exposure is predicted to be 69 dB Ldn or less at all proposed residences in the development. Assuming a minimum building façade noise level reduction of 25 dB for new residential construction, the resulting interior noise levels would be 44 dB Ldn or less. Because this level satisfies the project standards of significance, ***this impact is considered less than significant.***

Mitigation for Impact 7: *None Required*

Impact 8 Noise impacts associated with project construction activities

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 12, ranging from 85 to 90 dB at a distance of 50 feet. 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.

The construction noise levels provided in Table 12 are maximum noise levels (Lmax) at a distance of 50 feet. To determine whether or not a sensitive receptor would be exposed to construction noise levels in excess of 60 dB Ldn, the distance from the construction activities to the receptor, as well as the duration of time each type of construction activity would occur, would need to be known.

Because there will be occupied residences located near project construction activities, it is reasonable to conclude that such construction activities would result in a short-term substantial increase in ambient noise levels at the occupied residence. Although CEQA does not define what is considered “substantial”, clearly noticeable noise increases of 5 dB are normally considered significant, and such increases would likely occur during project construction. Because of the nature of project construction activities, feasible noise mitigation for reducing this potential impact to a level of insignificance is unavailable. As a result, temporary substantial noise increases associated with project construction would be considered ***significant and unavoidable***.

Table 12
Construction Equipment Noise

Equipment Description	Typical Use Factor %	Predicted Lmax @50 ft (dBA, Lmax)
Backhoe	40	80
Concrete Mixer Truck	40	85
Concrete Pump Truck	20	82
Dozer	40	85
Dump Truck	40	84
Excavator	40	85
Flat Bed Truck	40	84
Front End Loader	40	80
Jack Hammer	25	80
Pickup Truck	40	55
Pneumatic Tools	50	85
All Other Equipment > 5 HP	50	85

Source: FHWA, 2006

Mitigation for Impact 8

MM 8: Construction activities taking place in City of Vacaville shall be restricted to 7:00 a.m. to 7:00 p.m. Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays, Sundays, and Federal Holidays. The intent of this measure is to prevent construction activities during the more sensitive nighttime period.

Significance after Mitigation: With implementation of Mitigation Measure 8, noise from construction activities would be limited to less sensitive daytime hours. However, during daytime hours substantial short-term increases in ambient noise levels could occur at noise-sensitive uses when project construction activities are occurring nearby. As a result, this impact would be **remain significant and unavoidable.**

Impact 9 Increases in baseline traffic noise levels at existing residences due to development of the project site.

Traffic noise impacts are identified where baseline traffic noise levels with the project would significantly exceed existing or future traffic noise levels without the project.

Comparison of baseline traffic noise levels with and without the proposed project (Table 3) indicates that the project-related increase in noise would be

insignificant relative to the FICON criteria shown in Table 10 on all roadway segments under the project conditions with the extension of Foxboro Parkway. Along one roadway segment without the proposed extension, Nut Tree Road north of Opal, the project-related increase with the roadway extension would be 8 dB, which is considered a substantial increase. However, noise barriers have been constructed as part of the developments on each side of Nut Tree Road north of Opal, which would reduce the projected exposure at the outdoor activity areas of these residences to less than 60 dB Ldn. As a result, the traffic noise increase resulting from the Foxboro Parkway circulation option not being implemented is not expected to result in adverse noise impacts. Therefore, the increase in traffic noise levels at existing residences due to the project development is considered to be ***less than significant.***

Mitigation for Impact 9: *None Required*

Impact 10 **Increases in cumulative traffic noise levels at existing residences due to development of the project site.**

Traffic noise impacts are identified where the contribution of project-generated traffic noise level increases to the cumulative increase in traffic noise levels is considerable.

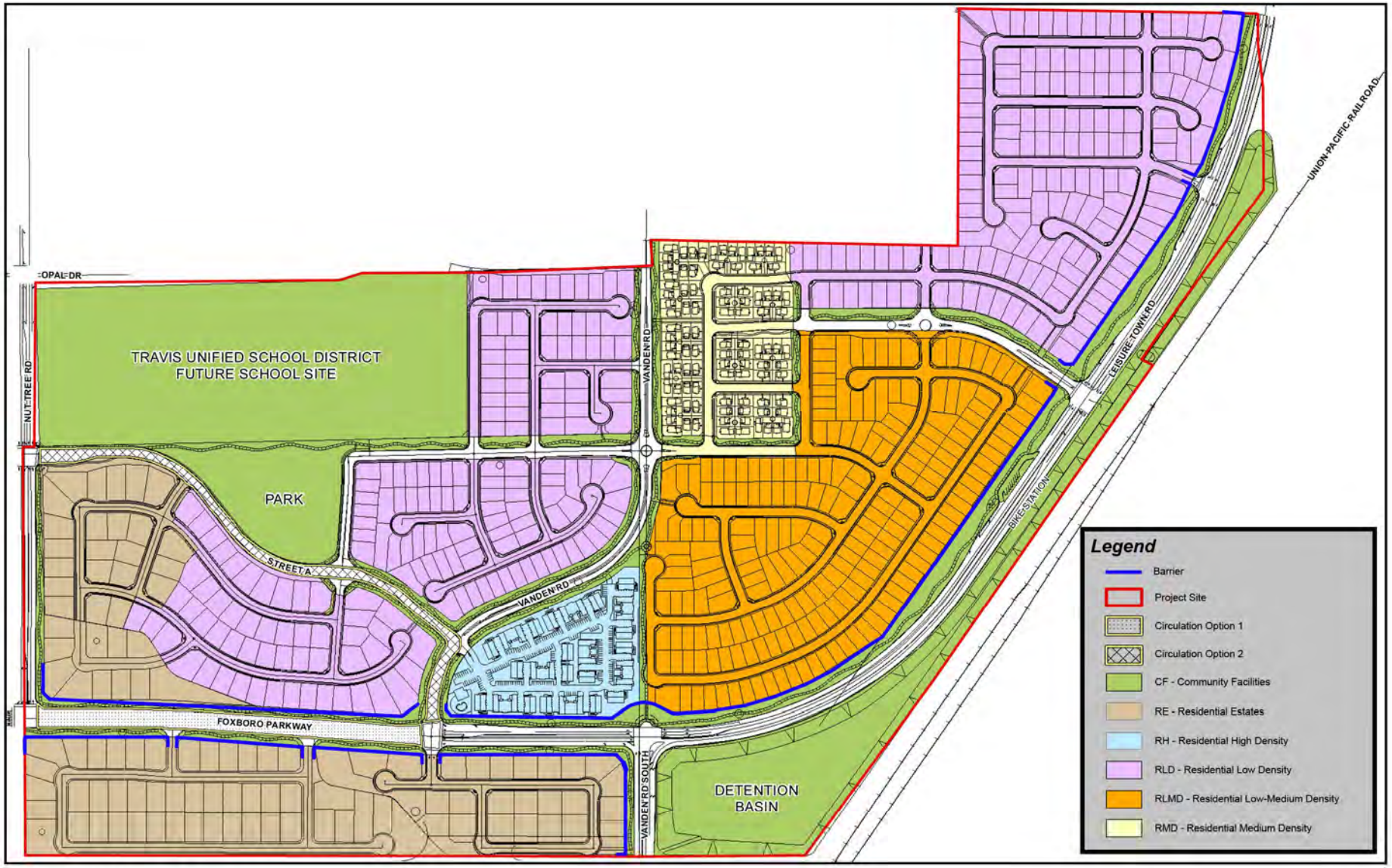
According to Table 11, the change in cumulative traffic noise levels due to the project would be considerable on one roadway segment; Vanden Road South of Park. The increase in cumulative traffic noise levels along this segment is predicted to be 8 dB (increase from 50 dB Ldn to 58 dB Ldn). Although this increase is substantial, this segment is within the project site so there are no existing residences which would experience the increase. As a result, the project-related traffic noise increase along this roadway segment is predicted to be less than significant.

Mitigation for Impact 10: *None Required*

Figure 4

Vanden Meadows Specific Plan EIR - Vacaville, California

Recommended Noise Barrier Locations



Appendix A

Acoustical Terminology

Acoustics	The science 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 an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell 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 Bell.
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 weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
Loudness	A subjective term for the sensation of the magnitude of sound.
Masking	The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.
Noise	Unwanted sound.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.
RT_{60}	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy of the event into a 1-s time period.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.

Appendix B-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Vanden Road	S of Alamo	5,630	80		20	3	2	30	100	
2	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	6,170	80		20	3	2	55	100	
3	Vanden Road	Foxboro to Proposed City Limits	11,800	80		20	3	2	50	100	
4	Alamo Drive	W of Interstate 80 EB Ramps	22,360	80		20	3	2	35	100	
5	Alamo Drive	W of Marshall	25,720	80		20	3	2	35	100	
6	Alamo Drive	W of Peabody	20,980	80		20	3	2	40	100	
7	Alamo Drive	W of Nut Tree	13,790	80		20	3	2	45	100	
8	Alamo Drive	W of Vanden	12,940	80		20	3	2	45	100	
9	Alamo Drive	W of Leisure Town	5,180	80		20	3	2	45	100	
10	Leisure Town Road	N of EB Ramps	16,250	80		20	3	2	45	100	
11	Leisure Town Road	N of Orange	17,600	80		20	3	2	45	100	
12	Leisure Town Road	N of Sequoia	14,140	80		20	3	2	45	100	
13	Leisure Town Road	N of Elmira	15,260	80		20	3	2	45	100	
14	Leisure Town Road	N of Alamo	9,880	80		20	3	2	45	100	
15	Leisure Town Road	S of Alamo	6,130	80		20	3	2	45	100	
16	Leisure Town Road	E of Foxboro	5,810	80		20	3	2	45	100	
17	Leisure Town Road	S of Foxboro	11,800	80		20	3	2	45	100	
18	Nut Tree Road	N of Alamo	13,300	80		20	3	2	45	100	
19	Nut Tree Road	S of Alamo	9,820	80		20	3	2	45	100	
20	Peabody Road	N of Alamo	17,930	80		20	3	2	45	100	
21	Peabody Road	S of Alamo	20,940	80		20	3	2	50	100	
22	Peabody Road	N of Foxboro	18,900	80		20	3	2	50	100	
23	Peabody Road	S of Foxboro	17,920	80		20	3	2	50	100	
24	Peabody Road	City Limits	19,470	80		20	3	2	50	100	

Appendix B-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Vanden Road	S of Alamo	4,130	80		20	3	2	30	100	
2	Vanden Road	N of Park	2,500	80		20	3	2	30	100	
3	Vanden Road	S of Park	1,630	80		20	3	2	30	100	
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	2,070	80		20	3	2	55	100	
5	Vanden Road	Foxboro to Proposed City Limits	13,810	80		20	3	2	30	100	
6	Vanden Road	S of Proposed City Limits	13,810	80		20	3	2	50	100	
7	Alamo Drive	W of Interstate 80 EB Ramps	25,180	80		20	3	2	35	100	
8	Alamo Drive	W of Marshall	34,090	80		20	3	2	35	100	
9	Alamo Drive	W of Peabody	26,530	80		20	3	2	40	100	
10	Alamo Drive	W of Nut Tree	17,690	80		20	3	2	45	100	
11	Alamo Drive	W of Vanden	8,280	80		20	3	2	45	100	
12	Alamo Drive	W of Leisure Town	5,010	80		20	3	2	45	100	
13	Leisure Town Road	N of EB Ramps	31,310	80		20	3	2	45	100	
14	Leisure Town Road	N of Orange	21,840	80		20	3	2	45	100	
15	Leisure Town Road	N of Sequoia	21,150	80		20	3	2	45	100	
16	Leisure Town Road	N of Elmira	8,140	80		20	3	2	45	100	
17	Leisure Town Road	N of Alamo	8,850	80		20	3	2	45	100	
18	Leisure Town Road	S of Alamo	9,060	80		20	3	2	45	100	
19	Leisure Town Road	N of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
20	Leisure Town Road	S of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
21	Leisure Town Road	E of Foxboro	5,250	80		20	3	2	45	100	
22	Leisure Town Road	S of Foxboro	13,810	80		20	3	2	45	100	
23	Nut Tree Road	N of Alamo	24,060	80		20	3	2	45	100	
24	Nut Tree Road	S of Alamo	31,720	80		20	3	2	45	100	

Appendix B-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
25	Nut Tree Road	N of Opal	6,000	80		20	3	2	45	100	
26	Nut Tree Road	N of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
27	Nut Tree Road	S of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
28	Nut Tree Road	N of Foxboro	4,670	80		20	3	2	45	100	
29	Peabody Road	North of Alamo	24,060	80		20	3	2	45	100	
30	Peabody Road	S of Alamo	31,720	80		20	3	2	50	100	
31	Peabody Road	N of Foxboro	30,010	80		20	3	2	50	100	
32	Peabody Road	S of Foxboro	25,840	80		20	3	2	50	100	
33	Peabody Road	City Limits	24,980	80		20	3	2	50	100	
34	Foxboro Parkway	West of Nut Tree	25,000	80		20	3	2	50	100	
35	Foxboro Parkway	East of Nut Tree	7,210	80		20	3	2	50	100	
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	80		20	3	2	50	100	
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	N/A	80		20	3	2	50	100	

Appendix B-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Vanden Road	S of Alamo	4,370	80		20	3	2	30	100	
2	Vanden Road	N of Park	2,850	80		20	3	2	30	100	
3	Vanden Road	S of Park	1,700	80		20	3	2	30	100	
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	3,820	80		20	3	2	55	100	
5	Vanden Road	Foxboro to Proposed City Limits	14,970	80		20	3	2	50	100	
6	Vanden Road	S of Proposed City Limits	260	80		20	3	2	50	100	
7	Alamo Drive	W of Interstate 80 EB Ramps	26,060	80		20	3	2	35	100	
8	Alamo Drive	W of Marshall	36,000	80		20	3	2	35	100	
9	Alamo Drive	W of Peabody	28,250	80		20	3	2	40	100	
10	Alamo Drive	W of Nut Tree	19,920	80		20	3	2	45	100	
11	Alamo Drive	W of Vanden	8,620	80		20	3	2	45	100	
12	Alamo Drive	W of Leisure Town	4,840	80		20	3	2	45	100	
13	Leisure Town Road	N of EB Ramps	31,970	80		20	3	2	45	100	
14	Leisure Town Road	N of Orange	22,630	80		20	3	2	45	100	
15	Leisure Town Road	N of Sequoia	8,730	80		20	3	2	45	100	
16	Leisure Town Road	N of Elmira	9,810	80		20	3	2	45	100	
17	Leisure Town Road	N of Alamo	10,570	80		20	3	2	45	100	
18	Leisure Town Road	S of Alamo	10,860	80		20	3	2	45	100	
19	Leisure Town Road	N of Vanden Meadows Collector	6,770	80		20	3	2	45	100	
20	Leisure Town Road	S of Vanden Meadows Collector	6,180	80		20	3	2	45	100	
21	Leisure Town Road	E of Foxboro	6,180	80		20	3	2	45	100	
22	Leisure Town Road	S of Foxboro	14,970	80		20	3	2	45	100	
23	Nut Tree Road	N of Alamo	15,920	80		20	3	2	45	100	
24	Nut Tree Road	S of Alamo	16,770	80		20	3	2	45	100	

Appendix B-5

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
25	Nut Tree Road	N of Opal	8,640	80		20	3	2	45	100	
26	Nut Tree Road	N of Vanden Meadows Collector	6,010	80		20	3	2	45	100	
27	Nut Tree Road	S of Vanden Meadows Collector	4,750	80		20	3	2	45	100	
28	Nut Tree Road	N of Foxboro	4,750	80		20	3	2	45	100	
29	Peabody Road	North of Alamo	24,580	80		20	3	2	45	100	
30	Peabody Road	S of Alamo	32,670	80		20	3	2	50	100	
31	Peabody Road	N of Foxboro	31,240	80		20	3	2	50	100	
32	Peabody Road	S of Foxboro	26,200	80		20	3	2	50	100	
33	Peabody Road	City Limits	25,350	80		20	3	2	50	100	
34	Foxboro Parkway	West of Nut Tree	3,760	80		20	3	2	50	100	
35	Foxboro Parkway	East of Nut Tree	8,470	80		20	3	2	50	100	
36	Foxboro Parkway	W of Vanden Meadows Collector	8,330	80		20	3	2	50	100	
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	10,300	80		20	3	2	50	100	

Appendix B-6

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Vanden Road	S of Alamo	4,620	80		20	3	2	30	100	
2	Vanden Road	N of Park	3,000	80		20	3	2	30	100	
3	Vanden Road	S of Park	5,340	80		20	3	2	30	100	
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	7,100	80		20	3	2	55	100	
5	Vanden Road	Foxboro to Proposed City Limits	14,290	80		20	3	2	50	100	
6	Vanden Road	S of Proposed City Limits	N/A	80		20	3	2	50	100	
7	Alamo Drive	W of Interstate 80 EB Ramps	22,620	80		20	3	2	35	100	
8	Alamo Drive	W of Marshall	33,080	80		20	3	2	35	100	
9	Alamo Drive	W of Peabody	27,730	80		20	3	2	40	100	
10	Alamo Drive	W of Nut Tree	15,960	80		20	3	2	45	100	
11	Alamo Drive	W of Vanden	9,190	80		20	3	2	45	100	
12	Alamo Drive	W of Leisure Town	5,220	80		20	3	2	45	100	
13	Leisure Town Road	N of EB Ramps	32,450	80		20	3	2	45	100	
14	Leisure Town Road	N of Orange	23,730	80		20	3	2	45	100	
15	Leisure Town Road	N of Sequoia	18,280	80		20	3	2	45	100	
16	Leisure Town Road	N of Elmira	11,140	80		20	3	2	45	100	
17	Leisure Town Road	N of Alamo	11,360	80		20	3	2	45	100	
18	Leisure Town Road	S of Alamo	11,300	80		20	3	2	45	100	
19	Leisure Town Road	N of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
20	Leisure Town Road	S of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
21	Leisure Town Road	E of Foxboro	7,190	80		20	3	2	45	100	
22	Leisure Town Road	S of Foxboro	14,290	80		20	3	2	45	100	
23	Nut Tree Road	N of Alamo	12,910	80		20	3	2	45	100	
24	Nut Tree Road	S of Alamo	11,130	80		20	3	2	45	100	

Appendix B-7

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
25	Nut Tree Road	N of Opal	1,630	80		20	3	2	45	100	
26	Nut Tree Road	N of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
27	Nut Tree Road	S of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
28	Nut Tree Road	N of Foxboro	N/A	80		20	3	2	45	100	
29	Peabody Road	North of Alamo	24,090	80		20	3	2	45	100	
30	Peabody Road	S of Alamo	32,550	80		20	3	2	50	100	
31	Peabody Road	N of Foxboro	28,760	80		20	3	2	50	100	
32	Peabody Road	S of Foxboro	25,310	80		20	3	2	50	100	
33	Peabody Road	City Limits	24,470	80		20	3	2	50	100	
34	Foxboro Parkway	West of Nut Tree	N/A	80		20	3	2	50	100	
35	Foxboro Parkway	East of Nut Tree	N/A	80		20	3	2	50	100	
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	80		20	3	2	50	100	
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	N/A	80		20	3	2	50	100	

Appendix B-8

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Vanden Road	S of Alamo	4,750	80		20	3	2	30	100	
2	Vanden Road	N of Park	3,200	80		20	3	2	30	100	
3	Vanden Road	S of Park	2,120	80		20	3	2	30	100	
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	9,740	80		20	3	2	55	100	
5	Vanden Road	Foxboro to Proposed City Limits	14,500	80		20	3	2	50	100	
6	Vanden Road	S of Proposed City Limits	240	80		20	3	2	50	100	
7	Alamo Drive	W of Interstate 80 EB Ramps	25,620	80		20	3	2	35	100	
8	Alamo Drive	W of Marshall	35,540	80		20	3	2	35	100	
9	Alamo Drive	W of Peabody	28,290	80		20	3	2	40	100	
10	Alamo Drive	W of Nut Tree	20,350	80		20	3	2	45	100	
11	Alamo Drive	W of Vanden	8,890	80		20	3	2	45	100	
12	Alamo Drive	W of Leisure Town	5,070	80		20	3	2	45	100	
13	Leisure Town Road	N of EB Ramps	31,890	80		20	3	2	45	100	
14	Leisure Town Road	N of Orange	22,540	80		20	3	2	45	100	
15	Leisure Town Road	N of Sequoia	16,990	80		20	3	2	45	100	
16	Leisure Town Road	N of Elmira	9,710	80		20	3	2	45	100	
17	Leisure Town Road	N of Alamo	10,270	80		20	3	2	45	100	
18	Leisure Town Road	S of Alamo	10,420	80		20	3	2	45	100	
19	Leisure Town Road	N of Vanden Meadows Collector	6,110	80		20	3	2	45	100	
20	Leisure Town Road	S of Vanden Meadows Collector	5,550	80		20	3	2	45	100	
21	Leisure Town Road	E of Foxboro	5,550	80		20	3	2	45	100	
22	Leisure Town Road	S of Foxboro	14,500	80		20	3	2	45	100	
23	Nut Tree Road	N of Alamo	15,170	80		20	3	2	45	100	
24	Nut Tree Road	S of Alamo	17,140	80		20	3	2	45	100	

Appendix B-9

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
25	Nut Tree Road	N of Opal	9,190	80		20	3	2	45	100	
26	Nut Tree Road	N of Vanden Meadows Collector	7,180	80		20	3	2	45	100	
27	Nut Tree Road	S of Vanden Meadows Collector	830	80		20	3	2	45	100	
28	Nut Tree Road	N of Foxboro	830	80		20	3	2	45	100	
29	Peabody Road	North of Alamo	24,540	80		20	3	2	45	100	
30	Peabody Road	S of Alamo	31,580	80		20	3	2	50	100	
31	Peabody Road	N of Foxboro	29,990	80		20	3	2	50	100	
32	Peabody Road	S of Foxboro	26,480	80		20	3	2	50	100	
33	Peabody Road	City Limits	25,630	80		20	3	2	50	100	
34	Foxboro Parkway	West of Nut Tree	830	80		20	3	2	50	100	
35	Foxboro Parkway	East of Nut Tree	N/A	80		20	3	2	50	100	
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	80		20	3	2	50	100	
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	9,650	80		20	3	2	50	100	

Appendix B-10

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension/Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Vanden Road	S of Alamo	5,180	80		20	3	2	30	100	
2	Vanden Road	N of Park	860	80		20	3	2	30	100	
3	Vanden Road	S of Park	730	80		20	3	2	30	100	
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	3,000	80		20	3	2	55	100	
5	Vanden Road	Foxboro to Proposed City Limits	22,120	80		20	3	2	30	100	
6	Vanden Road	S of Proposed City Limits	22,120	80		20	3	2	50	100	
7	Alamo Drive	W of Interstate 80 EB Ramps	30,390	80		20	3	2	35	100	
8	Alamo Drive	W of Marshall	32,750	80		20	3	2	35	100	
9	Alamo Drive	W of Peabody	29,120	80		20	3	2	40	100	
10	Alamo Drive	W of Nut Tree	20,920	80		20	3	2	45	100	
11	Alamo Drive	W of Vanden	14,050	80		20	3	2	45	100	
12	Alamo Drive	W of Leisure Town	10,850	80		20	3	2	45	100	
13	Leisure Town Road	N of EB Ramps	59,160	80		20	3	2	45	100	
14	Leisure Town Road	N of Orange	53,960	80		20	3	2	45	100	
15	Leisure Town Road	N of Sequoia	42,160	80		20	3	2	45	100	
16	Leisure Town Road	N of Elmira	30,470	80		20	3	2	45	100	
17	Leisure Town Road	N of Alamo	30,670	80		20	3	2	45	100	
18	Leisure Town Road	S of Alamo	27,490	80		20	3	2	45	100	
19	Leisure Town Road	N of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
20	Leisure Town Road	S of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
21	Leisure Town Road	E of Foxboro	19,120	80		20	3	2	45	100	
22	Leisure Town Road	S of Foxboro	22,120	80		20	3	2	45	100	
23	Nut Tree Road	N of Alamo	13,710	80		20	3	2	45	100	
24	Nut Tree Road	S of Alamo	11,430	80		20	3	2	45	100	

Appendix B-11

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension/Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
25	Nut Tree Road	N of Opal	2,470	80		20	3	2	45	100	
26	Nut Tree Road	N of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
27	Nut Tree Road	S of Vanden Meadows Collector	N/A	80		20	3	2	45	100	
28	Nut Tree Road	N of Foxboro	N/A	80		20	3	2	45	100	
29	Peabody Road	North of Alamo	25,850	80		20	3	2	45	100	
30	Peabody Road	S of Alamo	33,750	80		20	3	2	50	100	
31	Peabody Road	N of Foxboro	32,920	80		20	3	2	50	100	
32	Peabody Road	S of Foxboro	30,560	80		20	3	2	50	100	
33	Peabody Road	City Limits	27,040	80		20	3	2	50	100	
34	Foxboro Parkway	West of Nut Tree	900	80		20	3	2	50	100	
35	Foxboro Parkway	East of Nut Tree	1,480	80		20	3	2	50	100	
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	80		20	3	2	50	100	
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	1,480	80		20	3	2	50	100	

Appendix B-12

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Vanden Road	S of Alamo	5,950	80		20	3	2	30	100	
2	Vanden Road	N of Park	1,750	80		20	3	2	30	100	
3	Vanden Road	S of Park	4,340	80		20	3	2	30	100	
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	2,990	80		20	3	2	30	100	
5	Vanden Road	Foxboro to Proposed City Limits	22,920	80		20	3	2	30	100	
6	Vanden Road	S of Proposed City Limits	22,920	80		20	3	2	50	100	
7	Alamo Drive	W of Interstate 80 EB Ramps	30,410	80		20	3	2	35	100	
8	Alamo Drive	W of Marshall	33,880	80		20	3	2	35	100	
9	Alamo Drive	W of Peabody	30,820	80		20	3	2	40	100	
10	Alamo Drive	W of Nut Tree	22,910	80		20	3	2	45	100	
11	Alamo Drive	W of Vanden	13,920	80		20	3	2	45	100	
12	Alamo Drive	W of Leisure Town	10,020	80		20	3	2	45	100	
13	Leisure Town Road	N of EB Ramps	52,310	80		20	3	2	45	100	
14	Leisure Town Road	N of Orange	54,770	80		20	3	2	45	100	
15	Leisure Town Road	N of Sequoia	43,190	80		20	3	2	45	100	
16	Leisure Town Road	N of Elmira	31,600	80		20	3	2	45	100	
17	Leisure Town Road	N of Alamo	32,770	80		20	3	2	45	100	
18	Leisure Town Road	S of Alamo	30,820	80		20	3	2	45	100	
19	Leisure Town Road	N of Vanden Meadows Collector	22,040	80		20	3	2	45	100	
20	Leisure Town Road	S of Vanden Meadows Collector	20,720	80		20	3	2	45	100	
21	Leisure Town Road	E of Foxboro	20,720	80		20	3	2	45	100	
22	Leisure Town Road	S of Foxboro	22,920	80		20	3	2	45	100	
23	Nut Tree Road	N of Alamo	15,490	80		20	3	2	45	100	
24	Nut Tree Road	S of Alamo	15,000	80		20	3	2	45	100	

Appendix B-13

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
25	Nut Tree Road	N of Opal	6,110	80		20	3	2	45	100	
26	Nut Tree Road	N of Vanden Meadows Collector	3,190	80		20	3	2	45	100	
27	Nut Tree Road	S of Vanden Meadows Collector	1,940	80		20	3	2	45	100	
28	Nut Tree Road	N of Foxboro	1,940	80		20	3	2	45	100	
29	Peabody Road	North of Alamo	25,920	80		20	3	2	45	100	
30	Peabody Road	S of Alamo	33,490	80		20	3	2	50	100	
31	Peabody Road	N of Foxboro	33,370	80		20	3	2	50	100	
32	Peabody Road	S of Foxboro	30,650	80		20	3	2	50	100	
33	Peabody Road	City Limits	27,110	80		20	3	2	50	100	
34	Foxboro Parkway	West of Nut Tree	2,030	80		20	3	2	50	100	
35	Foxboro Parkway	East of Nut Tree	3,780	80		20	3	2	50	100	
36	Foxboro Parkway	W of Vanden Meadows Collector	3,650	80		20	3	2	50	100	
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	4,740	80		20	3	2	50	100	

Appendix B-14

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Vanden Road	S of Alamo	5,950	80		20	3	2	30	100	
2	Vanden Road	N of Park	1,740	80		20	3	2	30	100	
3	Vanden Road	S of Park	4,610	80		20	3	2	30	100	
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	4,010	80		20	3	2	30	100	
5	Vanden Road	Foxboro to Proposed City Limits	22,790	80		20	3	2	30	100	
6	Vanden Road	S of Proposed City Limits	22,790	80		20	3	2	50	100	
7	Alamo Drive	W of Interstate 80 EB Ramps	30,400	80		20	3	2	35	100	
8	Alamo Drive	W of Marshall	33,750	80		20	3	2	35	100	
9	Alamo Drive	W of Peabody	30,740	80		20	3	2	40	100	
10	Alamo Drive	W of Nut Tree	23,030	80		20	3	2	45	100	
11	Alamo Drive	W of Vanden	14,190	80		20	3	2	45	100	
12	Alamo Drive	W of Leisure Town	10,340	80		20	3	2	45	100	
13	Leisure Town Road	N of EB Ramps	58,510	80		20	3	2	45	100	
14	Leisure Town Road	N of Orange	54,760	80		20	3	2	45	100	
15	Leisure Town Road	N of Sequoia	42,920	80		20	3	2	45	100	
16	Leisure Town Road	N of Elmira	31,480	80		20	3	2	45	100	
17	Leisure Town Road	N of Alamo	32,640	80		20	3	2	45	100	
18	Leisure Town Road	S of Alamo	30,410	80		20	3	2	45	100	
19	Leisure Town Road	N of Vanden Meadows Collector	21,250	80		20	3	2	45	100	
20	Leisure Town Road	S of Vanden Meadows Collector	20,120	80		20	3	2	45	100	
21	Leisure Town Road	E of Foxboro	20,120	80		20	3	2	45	100	
22	Leisure Town Road	S of Foxboro	22,790	80		20	3	2	45	100	
23	Nut Tree Road	N of Alamo	15,280	80		20	3	2	45	100	
24	Nut Tree Road	S of Alamo	15,290	80		20	3	2	45	100	

Appendix B-15

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
25	Nut Tree Road	N of Opal	6,170	80		20	3	2	45	100	
26	Nut Tree Road	N of Vanden Meadows Collector	3,460	80		20	3	2	45	100	
27	Nut Tree Road	S of Vanden Meadows Collector	410	80		20	3	2	45	100	
28	Nut Tree Road	N of Foxboro	410	80		20	3	2	45	100	
29	Peabody Road	North of Alamo	26,230	80		20	3	2	45	100	
30	Peabody Road	S of Alamo	33,270	80		20	3	2	50	100	
31	Peabody Road	N of Foxboro	32,890	80		20	3	2	50	100	
32	Peabody Road	S of Foxboro	30,700	80		20	3	2	50	100	
33	Peabody Road	City Limits	27,180	80		20	3	2	50	100	
34	Foxboro Parkway	West of Nut Tree	410	80		20	3	2	50	100	
35	Foxboro Parkway	East of Nut Tree	N/A	80		20	3	2	50	100	
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	80		20	3	2	50	100	
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	3,930	80		20	3	2	50	100	

Appendix C-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Vanden Road	S of Alamo	54.6	50.2	55.5	59
2	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	62.6	54.7	56.8	64
3	Vanden Road	Foxboro to Proposed City Limits	64.2	56.8	59.3	66
4	Alamo Drive	W of Interstate 80 EB Ramps	62.5	57.2	60.6	65
5	Alamo Drive	W of Marshall	63.1	57.8	61.2	66
6	Alamo Drive	W of Peabody	63.9	57.8	60.9	66
7	Alamo Drive	W of Nut Tree	63.5	56.8	59.5	66
8	Alamo Drive	W of Vanden	63.3	56.5	59.2	65
9	Alamo Drive	W of Leisure Town	59.3	52.5	55.3	61
10	Leisure Town Road	N of EB Ramps	64.3	57.5	60.2	66
11	Leisure Town Road	N of Orange	64.6	57.8	60.6	67
12	Leisure Town Road	N of Sequoia	63.7	56.9	59.6	66
13	Leisure Town Road	N of Elmira	64.0	57.2	60.0	66
14	Leisure Town Road	N of Alamo	62.1	55.3	58.1	64
15	Leisure Town Road	S of Alamo	60.0	53.3	56.0	62
16	Leisure Town Road	E of Foxboro	59.8	53.0	55.8	62
17	Leisure Town Road	S of Foxboro	62.9	56.1	58.8	65
18	Nut Tree Road	N of Alamo	63.4	56.6	59.4	65
19	Nut Tree Road	S of Alamo	62.1	55.3	58.1	64
20	Peabody Road	N of Alamo	64.7	57.9	60.7	67
21	Peabody Road	S of Alamo	66.7	59.3	61.8	68
22	Peabody Road	N of Foxboro	66.2	58.9	61.3	68
23	Peabody Road	S of Foxboro	66.0	58.6	61.1	68
24	Peabody Road	City Limits	66.4	59.0	61.4	68

Appendix C-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Vanden Road	S of Alamo	53.2	48.8	54.2	57
2	Vanden Road	N of Park	51.1	46.6	52.0	55
3	Vanden Road	S of Park	49.2	44.8	50.1	53
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	57.8	49.9	52.1	59
5	Vanden Road	Foxboro to Proposed City Limits	58.5	54.0	59.4	63
6	Vanden Road	S of Proposed City Limits	64.9	57.5	60.0	67
7	Alamo Drive	W of Interstate 80 EB Ramps	63.0	57.7	61.1	66
8	Alamo Drive	W of Marshall	64.3	59.0	62.5	67
9	Alamo Drive	W of Peabody	64.9	58.8	61.9	67
10	Alamo Drive	W of Nut Tree	64.6	57.9	60.6	67
11	Alamo Drive	W of Vanden	61.3	54.6	57.3	63
12	Alamo Drive	W of Leisure Town	59.1	52.4	55.1	61
13	Leisure Town Road	N of EB Ramps	67.1	60.4	63.1	69
14	Leisure Town Road	N of Orange	65.5	58.8	61.5	68
15	Leisure Town Road	N of Sequoia	65.4	58.6	61.4	67
16	Leisure Town Road	N of Elmira	61.3	54.5	57.2	63
17	Leisure Town Road	N of Alamo	61.6	54.9	57.6	64
18	Leisure Town Road	S of Alamo	61.7	55.0	57.7	64
19	Leisure Town Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A
20	Leisure Town Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A
21	Leisure Town Road	E of Foxboro	59.4	52.6	55.3	61
22	Leisure Town Road	S of Foxboro	63.6	56.8	59.5	66
23	Nut Tree Road	N of Alamo	66.0	59.2	61.9	68
24	Nut Tree Road	S of Alamo	67.2	60.4	63.1	69

Appendix C-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
25	Nut Tree Road	N of Opal	59.9	53.2	55.9	62
26	Nut Tree Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A
27	Nut Tree Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A
28	Nut Tree Road	N of Foxboro	58.8	52.1	54.8	61
29	Peabody Road	North of Alamo	66.0	59.2	61.9	68
30	Peabody Road	S of Alamo	68.5	61.1	63.6	70
31	Peabody Road	N of Foxboro	68.2	60.9	63.3	70
32	Peabody Road	S of Foxboro	67.6	60.2	62.7	69
33	Peabody Road	City Limits	67.4	60.1	62.5	69
34	Foxboro Parkway	West of Nut Tree	67.4	60.1	62.5	69
35	Foxboro Parkway	East of Nut Tree	62.0	54.7	57.1	64
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	N/A	N/A	N/A
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	N/A	N/A	N/A	N/A

Appendix C-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Vanden Road	S of Alamo	53.5	49.1	54.4	58
2	Vanden Road	N of Park	51.6	47.2	52.6	56
3	Vanden Road	S of Park	49.4	45.0	50.3	54
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	60.5	52.6	54.8	62
5	Vanden Road	Foxboro to Proposed City Limits	65.2	57.9	60.3	67
6	Vanden Road	S of Proposed City Limits	47.6	40.3	42.7	49
7	Alamo Drive	W of Interstate 80 EB Ramps	63.2	57.9	61.3	66
8	Alamo Drive	W of Marshall	64.6	59.3	62.7	67
9	Alamo Drive	W of Peabody	65.2	59.1	62.2	68
10	Alamo Drive	W of Nut Tree	65.1	58.4	61.1	67
11	Alamo Drive	W of Vanden	61.5	54.7	57.5	64
12	Alamo Drive	W of Leisure Town	59.0	52.2	55.0	61
13	Leisure Town Road	N of EB Ramps	67.2	60.4	63.2	69
14	Leisure Town Road	N of Orange	65.7	58.9	61.7	68
15	Leisure Town Road	N of Sequoia	61.6	54.8	57.5	64
16	Leisure Town Road	N of Elmira	62.1	55.3	58.0	64
17	Leisure Town Road	N of Alamo	62.4	55.6	58.4	64
18	Leisure Town Road	S of Alamo	62.5	55.8	58.5	65
19	Leisure Town Road	N of Vanden Meadows Collector	60.5	53.7	56.4	63
20	Leisure Town Road	S of Vanden Meadows Collector	60.1	53.3	56.0	62
21	Leisure Town Road	E of Foxboro	60.1	53.3	56.0	62
22	Leisure Town Road	S of Foxboro	63.9	57.1	59.9	66
23	Nut Tree Road	N of Alamo	64.2	57.4	60.1	66
24	Nut Tree Road	S of Alamo	64.4	57.6	60.4	66

Appendix C-5

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
25	Nut Tree Road	N of Opal	61.5	54.8	57.5	64
26	Nut Tree Road	N of Vanden Meadows Collector	59.9	53.2	55.9	62
27	Nut Tree Road	S of Vanden Meadows Collector	58.9	52.2	54.9	61
28	Nut Tree Road	N of Foxboro	58.9	52.2	54.9	61
29	Peabody Road	North of Alamo	66.1	59.3	62.0	68
30	Peabody Road	S of Alamo	68.6	61.2	63.7	70
31	Peabody Road	N of Foxboro	68.4	61.1	63.5	70
32	Peabody Road	S of Foxboro	67.7	60.3	62.7	69
33	Peabody Road	City Limits	67.5	60.1	62.6	69
34	Foxboro Parkway	West of Nut Tree	59.2	51.9	54.3	61
35	Foxboro Parkway	East of Nut Tree	62.7	55.4	57.8	65
36	Foxboro Parkway	W of Vanden Meadows Collector	62.7	55.3	57.8	64
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	63.6	56.2	58.7	65

Appendix C-6

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Vanden Road	S of Alamo	53.7	49.3	54.7	58
2	Vanden Road	N of Park	51.9	47.4	52.8	56
3	Vanden Road	S of Park	54.4	49.9	55.3	59
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	63.2	55.3	57.4	65
5	Vanden Road	Foxboro to Proposed City Limits	65.0	57.7	60.1	67
6	Vanden Road	S of Proposed City Limits	N/A	N/A	N/A	N/A
7	Alamo Drive	W of Interstate 80 EB Ramps	62.6	57.2	60.7	65
8	Alamo Drive	W of Marshall	64.2	58.9	62.3	67
9	Alamo Drive	W of Peabody	65.1	59.0	62.1	68
10	Alamo Drive	W of Nut Tree	64.2	57.4	60.2	66
11	Alamo Drive	W of Vanden	61.8	55.0	57.8	64
12	Alamo Drive	W of Leisure Town	59.3	52.6	55.3	61
13	Leisure Town Road	N of EB Ramps	67.3	60.5	63.2	69
14	Leisure Town Road	N of Orange	65.9	59.1	61.9	68
15	Leisure Town Road	N of Sequoia	64.8	58.0	60.8	67
16	Leisure Town Road	N of Elmira	62.6	55.9	58.6	65
17	Leisure Town Road	N of Alamo	62.7	55.9	58.7	65
18	Leisure Town Road	S of Alamo	62.7	55.9	58.7	65
19	Leisure Town Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A
20	Leisure Town Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A
21	Leisure Town Road	E of Foxboro	60.7	54.0	56.7	63
22	Leisure Town Road	S of Foxboro	63.7	56.9	59.7	66
23	Nut Tree Road	N of Alamo	63.3	56.5	59.2	65
24	Nut Tree Road	S of Alamo	62.6	55.9	58.6	65

Appendix C-7

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
25	Nut Tree Road	N of Opal	54.3	47.5	50.3	56
26	Nut Tree Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A
27	Nut Tree Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A
28	Nut Tree Road	N of Foxboro	N/A	N/A	N/A	N/A
29	Peabody Road	North of Alamo	66.0	59.2	61.9	68
30	Peabody Road	S of Alamo	68.6	61.2	63.7	70
31	Peabody Road	N of Foxboro	68.1	60.7	63.1	70
32	Peabody Road	S of Foxboro	67.5	60.1	62.6	69
33	Peabody Road	City Limits	67.4	60.0	62.4	69
34	Foxboro Parkway	West of Nut Tree	N/A	N/A	N/A	N/A
35	Foxboro Parkway	East of Nut Tree	N/A	N/A	N/A	N/A
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	N/A	N/A	N/A
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	N/A	N/A	N/A	N/A

Appendix C-8

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Vanden Road	S of Alamo	53.8	49.4	54.8	58
2	Vanden Road	N of Park	52.1	47.7	53.1	56
3	Vanden Road	S of Park	50.3	45.9	51.3	54
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	64.5	56.6	58.8	66
5	Vanden Road	Foxboro to Proposed City Limits	65.1	57.7	60.2	67
6	Vanden Road	S of Proposed City Limits	47.3	39.9	42.4	49
7	Alamo Drive	W of Interstate 80 EB Ramps	63.1	57.8	61.2	66
8	Alamo Drive	W of Marshall	64.5	59.2	62.6	67
9	Alamo Drive	W of Peabody	65.2	59.1	62.2	68
10	Alamo Drive	W of Nut Tree	65.2	58.5	61.2	67
11	Alamo Drive	W of Vanden	61.6	54.9	57.6	64
12	Alamo Drive	W of Leisure Town	59.2	52.4	55.2	61
13	Leisure Town Road	N of EB Ramps	67.2	60.4	63.2	69
14	Leisure Town Road	N of Orange	65.7	58.9	61.7	68
15	Leisure Town Road	N of Sequoia	64.5	57.7	60.4	67
16	Leisure Town Road	N of Elmira	62.0	55.3	58.0	64
17	Leisure Town Road	N of Alamo	62.3	55.5	58.2	64
18	Leisure Town Road	S of Alamo	62.3	55.6	58.3	64
19	Leisure Town Road	N of Vanden Meadows Collector	60.0	53.3	56.0	62
20	Leisure Town Road	S of Vanden Meadows Collector	59.6	52.8	55.6	62
21	Leisure Town Road	E of Foxboro	59.6	52.8	55.6	62
22	Leisure Town Road	S of Foxboro	63.8	57.0	59.7	66
23	Nut Tree Road	N of Alamo	64.0	57.2	59.9	66
24	Nut Tree Road	S of Alamo	64.5	57.7	60.5	67

Appendix C-9

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
25	Nut Tree Road	N of Opal	61.8	55.0	57.8	64
26	Nut Tree Road	N of Vanden Meadows Collector	60.7	54.0	56.7	63
27	Nut Tree Road	S of Vanden Meadows Collector	51.3	44.6	47.3	53
28	Nut Tree Road	N of Foxboro	51.3	44.6	47.3	53
29	Peabody Road	North of Alamo	66.0	59.3	62.0	68
30	Peabody Road	S of Alamo	68.5	61.1	63.5	70
31	Peabody Road	N of Foxboro	68.2	60.9	63.3	70
32	Peabody Road	S of Foxboro	67.7	60.3	62.8	69
33	Peabody Road	City Limits	67.6	60.2	62.6	69
34	Foxboro Parkway	West of Nut Tree	52.7	45.3	47.7	54
35	Foxboro Parkway	East of Nut Tree	N/A	N/A	N/A	N/A
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	N/A	N/A	N/A
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	63.3	56.0	58.4	65

Appendix C-10

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension/Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Vanden Road	S of Alamo	54.2	49.8	55.2	58
2	Vanden Road	N of Park	46.4	42.0	47.4	51
3	Vanden Road	S of Park	45.7	41.3	46.6	50
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	59.4	51.5	53.7	61
5	Vanden Road	Foxboro to Proposed City Limits	60.5	56.1	61.5	65
6	Vanden Road	S of Proposed City Limits	66.9	59.6	62.0	69
7	Alamo Drive	W of Interstate 80 EB Ramps	63.8	58.5	62.0	67
8	Alamo Drive	W of Marshall	64.2	58.8	62.3	67
9	Alamo Drive	W of Peabody	65.3	59.2	62.3	68
10	Alamo Drive	W of Nut Tree	65.4	58.6	61.3	67
11	Alamo Drive	W of Vanden	63.6	56.9	59.6	66
12	Alamo Drive	W of Leisure Town	62.5	55.7	58.5	65
13	Leisure Town Road	N of EB Ramps	69.9	63.1	65.9	72
14	Leisure Town Road	N of Orange	69.5	62.7	65.5	72
15	Leisure Town Road	N of Sequoia	68.4	61.6	64.4	70
16	Leisure Town Road	N of Elmira	67.0	60.2	63.0	69
17	Leisure Town Road	N of Alamo	67.0	60.3	63.0	69
18	Leisure Town Road	S of Alamo	66.5	59.8	62.5	69
19	Leisure Town Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A
20	Leisure Town Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A
21	Leisure Town Road	E of Foxboro	65.0	58.2	60.9	67
22	Leisure Town Road	S of Foxboro	65.6	58.8	61.6	68
23	Nut Tree Road	N of Alamo	63.5	56.8	59.5	66
24	Nut Tree Road	S of Alamo	62.7	56.0	58.7	65

Appendix C-11

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension/Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
25	Nut Tree Road	N of Opal	56.1	49.3	52.1	58
26	Nut Tree Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A
27	Nut Tree Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A
28	Nut Tree Road	N of Foxboro	N/A	N/A	N/A	N/A
29	Peabody Road	North of Alamo	66.3	59.5	62.3	68
30	Peabody Road	S of Alamo	68.8	61.4	63.8	71
31	Peabody Road	N of Foxboro	68.6	61.3	63.7	70
32	Peabody Road	S of Foxboro	68.3	61.0	63.4	70
33	Peabody Road	City Limits	67.8	60.4	62.9	70
34	Foxboro Parkway	West of Nut Tree	53.0	45.7	48.1	55
35	Foxboro Parkway	East of Nut Tree	55.2	47.8	50.3	57
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	N/A	N/A	N/A
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	55.2	47.8	50.3	57

Appendix C-12

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Vanden Road	S of Alamo	54.8	50.4	55.8	59
2	Vanden Road	N of Park	49.5	45.1	50.4	54
3	Vanden Road	S of Park	53.5	49.0	54.4	58
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	51.8	47.4	52.8	56
5	Vanden Road	Foxboro to Proposed City Limits	60.7	56.2	61.6	65
6	Vanden Road	S of Proposed City Limits	67.1	59.7	62.2	69
7	Alamo Drive	W of Interstate 80 EB Ramps	63.8	58.5	62.0	67
8	Alamo Drive	W of Marshall	64.3	59.0	62.4	67
9	Alamo Drive	W of Peabody	65.6	59.5	62.5	68
10	Alamo Drive	W of Nut Tree	65.8	59.0	61.7	68
11	Alamo Drive	W of Vanden	63.6	56.8	59.6	66
12	Alamo Drive	W of Leisure Town	62.2	55.4	58.1	64
13	Leisure Town Road	N of EB Ramps	69.3	62.6	65.3	71
14	Leisure Town Road	N of Orange	69.5	62.8	65.5	72
15	Leisure Town Road	N of Sequoia	68.5	61.7	64.5	71
16	Leisure Town Road	N of Elmira	67.1	60.4	63.1	69
17	Leisure Town Road	N of Alamo	67.3	60.5	63.3	69
18	Leisure Town Road	S of Alamo	67.0	60.3	63.0	69
19	Leisure Town Road	N of Vanden Meadows Collector	65.6	58.8	61.6	68
20	Leisure Town Road	S of Vanden Meadows Collector	65.3	58.6	61.3	67
21	Leisure Town Road	E of Foxboro	65.3	58.6	61.3	67
22	Leisure Town Road	S of Foxboro	65.8	59.0	61.7	68
23	Nut Tree Road	N of Alamo	64.1	57.3	60.0	66
24	Nut Tree Road	S of Alamo	63.9	57.2	59.9	66

Appendix C-13

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
25	Nut Tree Road	N of Opal	60.0	53.3	56.0	62
26	Nut Tree Road	N of Vanden Meadows Collector	57.2	50.4	53.2	59
27	Nut Tree Road	S of Vanden Meadows Collector	55.0	48.3	51.0	57
28	Nut Tree Road	N of Foxboro	55.0	48.3	51.0	57
29	Peabody Road	North of Alamo	66.3	59.5	62.3	68
30	Peabody Road	S of Alamo	68.7	61.4	63.8	70
31	Peabody Road	N of Foxboro	68.7	61.3	63.8	70
32	Peabody Road	S of Foxboro	68.3	61.0	63.4	70
33	Peabody Road	City Limits	67.8	60.4	62.9	70
34	Foxboro Parkway	West of Nut Tree	56.5	49.2	51.6	58
35	Foxboro Parkway	East of Nut Tree	59.2	51.9	54.3	61
36	Foxboro Parkway	W of Vanden Meadows Collector	59.1	51.7	54.2	61
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	60.2	52.9	55.3	62

Appendix C-14

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Vanden Road	S of Alamo	54.8	50.4	55.8	59
2	Vanden Road	N of Park	49.5	45.1	50.4	54
3	Vanden Road	S of Park	53.7	49.3	54.6	58
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	53.1	48.7	54.0	57
5	Vanden Road	Foxboro to Proposed City Limits	60.7	56.2	61.6	65
6	Vanden Road	S of Proposed City Limits	67.0	59.7	62.1	69
7	Alamo Drive	W of Interstate 80 EB Ramps	63.8	58.5	62.0	67
8	Alamo Drive	W of Marshall	64.3	59.0	62.4	67
9	Alamo Drive	W of Peabody	65.6	59.5	62.5	68
10	Alamo Drive	W of Nut Tree	65.8	59.0	61.8	68
11	Alamo Drive	W of Vanden	63.7	56.9	59.7	66
12	Alamo Drive	W of Leisure Town	62.3	55.5	58.3	64
13	Leisure Town Road	N of EB Ramps	69.8	63.1	65.8	72
14	Leisure Town Road	N of Orange	69.5	62.8	65.5	72
15	Leisure Town Road	N of Sequoia	68.5	61.7	64.5	71
16	Leisure Town Road	N of Elmira	67.1	60.4	63.1	69
17	Leisure Town Road	N of Alamo	67.3	60.5	63.3	69
18	Leisure Town Road	S of Alamo	67.0	60.2	63.0	69
19	Leisure Town Road	N of Vanden Meadows Collector	65.4	58.7	61.4	67
20	Leisure Town Road	S of Vanden Meadows Collector	65.2	58.4	61.2	67
21	Leisure Town Road	E of Foxboro	65.2	58.4	61.2	67
22	Leisure Town Road	S of Foxboro	65.7	59.0	61.7	68
23	Nut Tree Road	N of Alamo	64.0	57.2	60.0	66
24	Nut Tree Road	S of Alamo	64.0	57.2	60.0	66

Appendix C-15

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
25	Nut Tree Road	N of Opal	60.1	53.3	56.0	62
26	Nut Tree Road	N of Vanden Meadows Collector	57.5	50.8	53.5	60
27	Nut Tree Road	S of Vanden Meadows Collector	48.3	41.5	44.3	50
28	Nut Tree Road	N of Foxboro	48.3	41.5	44.3	50
29	Peabody Road	North of Alamo	66.3	59.6	62.3	68
30	Peabody Road	S of Alamo	68.7	61.3	63.8	70
31	Peabody Road	N of Foxboro	68.6	61.3	63.7	70
32	Peabody Road	S of Foxboro	68.3	61.0	63.4	70
33	Peabody Road	City Limits	67.8	60.5	62.9	70
34	Foxboro Parkway	West of Nut Tree	49.6	42.2	44.7	51
35	Foxboro Parkway	East of Nut Tree	N/A	N/A	N/A	N/A
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	N/A	N/A	N/A
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	59.4	52.1	54.5	61

Appendix D-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Vanden Road	S of Alamo	8	18	38	82	177
2	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	19	41	87	188	405
3	Vanden Road	Foxboro to Proposed City Limits	25	54	116	250	538
4	Alamo Drive	W of Interstate 80 EB Ramps	23	49	106	229	492
5	Alamo Drive	W of Marshall	25	54	116	251	541
6	Alamo Drive	W of Peabody	26	57	122	264	568
7	Alamo Drive	W of Nut Tree	24	51	110	236	509
8	Alamo Drive	W of Vanden	23	49	105	227	488
9	Alamo Drive	W of Leisure Town	12	27	57	123	265
10	Leisure Town Road	N of EB Ramps	26	57	122	264	568
11	Leisure Town Road	N of Orange	28	60	129	278	599
12	Leisure Town Road	N of Sequoia	24	52	112	240	518
13	Leisure Town Road	N of Elmira	25	55	117	253	545
14	Leisure Town Road	N of Alamo	19	41	88	189	408
15	Leisure Town Road	S of Alamo	14	30	64	138	297
16	Leisure Town Road	E of Foxboro	13	29	62	133	286
17	Leisure Town Road	S of Foxboro	21	46	99	213	459
18	Nut Tree Road	N of Alamo	23	50	107	231	497
19	Nut Tree Road	S of Alamo	19	41	88	189	406
20	Peabody Road	N of Alamo	28	61	131	282	607
21	Peabody Road	S of Alamo	37	79	170	366	789
22	Peabody Road	N of Foxboro	34	74	159	342	737
23	Peabody Road	S of Foxboro	33	71	153	330	711
24	Peabody Road	City Limits	35	75	162	349	752

Appendix D-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Vanden Road	S of Alamo	7	14	31	67	144
2	Vanden Road	N of Park	5	10	22	48	103
3	Vanden Road	S of Park	4	8	17	36	78
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	9	20	42	91	196
5	Vanden Road	Foxboro to Proposed City Limits	15	32	70	150	323
6	Vanden Road	S of Proposed City Limits	28	60	129	277	598
7	Alamo Drive	W of Interstate 80 EB Ramps	25	53	115	247	533
8	Alamo Drive	W of Marshall	30	65	141	303	652
9	Alamo Drive	W of Peabody	31	66	143	308	664
10	Alamo Drive	W of Nut Tree	28	60	130	279	602
11	Alamo Drive	W of Vanden	17	36	78	168	363
12	Alamo Drive	W of Leisure Town	12	26	56	120	259
13	Leisure Town Road	N of EB Ramps	41	88	190	409	880
14	Leisure Town Road	N of Orange	32	69	149	321	692
15	Leisure Town Road	N of Sequoia	31	68	146	315	678
16	Leisure Town Road	N of Elmira	17	36	77	166	359
17	Leisure Town Road	N of Alamo	18	38	82	176	379
18	Leisure Town Road	S of Alamo	18	39	83	179	385
19	Leisure Town Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
20	Leisure Town Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
21	Leisure Town Road	E of Foxboro	12	27	58	124	268
22	Leisure Town Road	S of Foxboro	24	51	110	237	510
23	Nut Tree Road	N of Alamo	34	74	159	343	738
24	Nut Tree Road	S of Alamo	41	89	191	412	888

Appendix D-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
25	Nut Tree Road	N of Opal	14	29	63	136	293
26	Nut Tree Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
27	Nut Tree Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
28	Nut Tree Road	N of Foxboro	11	25	53	115	248
29	Peabody Road	North of Alamo	34	74	159	343	738
30	Peabody Road	S of Alamo	48	104	224	483	1041
31	Peabody Road	N of Foxboro	47	100	216	466	1003
32	Peabody Road	S of Foxboro	42	91	196	421	908
33	Peabody Road	City Limits	41	89	191	412	887
34	Foxboro Parkway	West of Nut Tree	41	89	191	412	888
35	Foxboro Parkway	East of Nut Tree	18	39	84	180	388
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	N/A	N/A	N/A	N/A	N/A

Appendix D-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Vanden Road	S of Alamo	7	15	32	70	150
2	Vanden Road	N of Park	5	11	24	52	113
3	Vanden Road	S of Park	4	8	17	37	80
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	14	29	63	137	294
5	Vanden Road	Foxboro to Proposed City Limits	29	63	136	293	631
6	Vanden Road	S of Proposed City Limits	2	4	9	20	42
7	Alamo Drive	W of Interstate 80 EB Ramps	25	55	118	253	545
8	Alamo Drive	W of Marshall	31	68	146	314	676
9	Alamo Drive	W of Peabody	32	69	149	321	693
10	Alamo Drive	W of Nut Tree	30	65	140	302	651
11	Alamo Drive	W of Vanden	17	37	80	173	372
12	Alamo Drive	W of Leisure Town	12	25	55	118	254
13	Leisure Town Road	N of EB Ramps	41	89	192	414	892
14	Leisure Town Road	N of Orange	33	71	153	329	709
15	Leisure Town Road	N of Sequoia	17	38	81	174	376
16	Leisure Town Road	N of Elmira	19	41	87	188	406
17	Leisure Town Road	N of Alamo	20	43	92	198	427
18	Leisure Town Road	S of Alamo	20	43	94	202	434
19	Leisure Town Road	N of Vanden Meadows Collector	15	32	68	147	317
20	Leisure Town Road	S of Vanden Meadows Collector	14	30	64	138	298
21	Leisure Town Road	E of Foxboro	14	30	64	138	298
22	Leisure Town Road	S of Foxboro	25	54	116	250	538
23	Nut Tree Road	N of Alamo	26	56	121	260	561
24	Nut Tree Road	S of Alamo	27	58	125	269	580

Appendix D-5

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
25	Nut Tree Road	N of Opal	17	37	80	173	373
26	Nut Tree Road	N of Vanden Meadows Collector	14	29	63	136	293
27	Nut Tree Road	S of Vanden Meadows Collector	12	25	54	116	250
28	Nut Tree Road	N of Foxboro	12	25	54	116	250
29	Peabody Road	North of Alamo	35	75	161	348	749
30	Peabody Road	S of Alamo	49	106	229	493	1061
31	Peabody Road	N of Foxboro	48	103	222	478	1030
32	Peabody Road	S of Foxboro	43	92	197	425	916
33	Peabody Road	City Limits	42	90	193	416	896
34	Foxboro Parkway	West of Nut Tree	12	25	54	117	251
35	Foxboro Parkway	East of Nut Tree	20	43	93	200	432
36	Foxboro Parkway	W of Vanden Meadows Collector	20	43	92	198	427
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	23	49	106	228	492

Appendix D-6

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Vanden Road	S of Alamo	7	16	33	72	155
2	Vanden Road	N of Park	5	12	25	54	117
3	Vanden Road	S of Park	8	17	37	79	171
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	21	44	96	207	445
5	Vanden Road	Foxboro to Proposed City Limits	28	61	132	284	612
6	Vanden Road	S of Proposed City Limits	N/A	N/A	N/A	N/A	N/A
7	Alamo Drive	W of Interstate 80 EB Ramps	23	50	107	230	496
8	Alamo Drive	W of Marshall	30	64	138	297	639
9	Alamo Drive	W of Peabody	32	68	147	318	684
10	Alamo Drive	W of Nut Tree	26	56	121	261	562
11	Alamo Drive	W of Vanden	18	39	84	180	389
12	Alamo Drive	W of Leisure Town	12	27	57	124	267
13	Leisure Town Road	N of EB Ramps	42	90	194	418	901
14	Leisure Town Road	N of Orange	34	73	158	340	732
15	Leisure Town Road	N of Sequoia	29	61	132	285	615
16	Leisure Town Road	N of Elmira	21	44	95	205	442
17	Leisure Town Road	N of Alamo	21	45	96	208	448
18	Leisure Town Road	S of Alamo	21	45	96	207	446
19	Leisure Town Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
20	Leisure Town Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
21	Leisure Town Road	E of Foxboro	15	33	71	153	330
22	Leisure Town Road	S of Foxboro	24	52	112	242	522
23	Nut Tree Road	N of Alamo	23	49	105	226	488
24	Nut Tree Road	S of Alamo	21	44	95	205	442

Appendix D-7

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
25	Nut Tree Road	N of Opal	6	12	26	57	123
26	Nut Tree Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
27	Nut Tree Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
28	Nut Tree Road	N of Foxboro	N/A	N/A	N/A	N/A	N/A
29	Peabody Road	North of Alamo	34	74	159	343	739
30	Peabody Road	S of Alamo	49	106	228	491	1059
31	Peabody Road	N of Foxboro	45	97	210	453	975
32	Peabody Road	S of Foxboro	42	90	193	416	895
33	Peabody Road	City Limits	41	88	189	406	875
34	Foxboro Parkway	West of Nut Tree	N/A	N/A	N/A	N/A	N/A
35	Foxboro Parkway	East of Nut Tree	N/A	N/A	N/A	N/A	N/A
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	N/A	N/A	N/A	N/A	N/A

Appendix D-8

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Vanden Road	S of Alamo	7	16	34	74	158
2	Vanden Road	N of Park	6	12	26	56	122
3	Vanden Road	S of Park	4	9	20	43	92
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	25	55	118	255	549
5	Vanden Road	Foxboro to Proposed City Limits	29	62	133	287	618
6	Vanden Road	S of Proposed City Limits	2	4	9	19	40
7	Alamo Drive	W of Interstate 80 EB Ramps	25	54	116	250	539
8	Alamo Drive	W of Marshall	31	67	145	311	671
9	Alamo Drive	W of Peabody	32	69	149	322	693
10	Alamo Drive	W of Nut Tree	31	66	142	307	660
11	Alamo Drive	W of Vanden	18	38	82	176	380
12	Alamo Drive	W of Leisure Town	12	26	56	121	261
13	Leisure Town Road	N of EB Ramps	41	89	192	414	891
14	Leisure Town Road	N of Orange	33	71	152	328	707
15	Leisure Town Road	N of Sequoia	27	59	126	272	586
16	Leisure Town Road	N of Elmira	19	40	87	187	403
17	Leisure Town Road	N of Alamo	19	42	90	194	419
18	Leisure Town Road	S of Alamo	20	42	91	196	423
19	Leisure Town Road	N of Vanden Meadows Collector	14	30	64	137	296
20	Leisure Town Road	S of Vanden Meadows Collector	13	28	60	129	278
21	Leisure Town Road	E of Foxboro	13	28	60	129	278
22	Leisure Town Road	S of Foxboro	24	53	114	245	527
23	Nut Tree Road	N of Alamo	25	54	117	252	543
24	Nut Tree Road	S of Alamo	27	59	127	273	589

Appendix D-9

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Existing with Approved Projects without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
25	Nut Tree Road	N of Opal	18	39	84	180	389
26	Nut Tree Road	N of Vanden Meadows Collector	15	33	71	153	330
27	Nut Tree Road	S of Vanden Meadows Collector	4	8	17	36	78
28	Nut Tree Road	N of Foxboro	4	8	17	36	78
29	Peabody Road	North of Alamo	35	75	161	347	748
30	Peabody Road	S of Alamo	48	104	224	482	1038
31	Peabody Road	N of Foxboro	47	100	216	465	1003
32	Peabody Road	S of Foxboro	43	92	199	428	923
33	Peabody Road	City Limits	42	90	195	419	903
34	Foxboro Parkway	West of Nut Tree	4	9	20	43	92
35	Foxboro Parkway	East of Nut Tree	N/A	N/A	N/A	N/A	N/A
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	22	47	101	219	471

Appendix D-10

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension/Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Vanden Road	S of Alamo	8	17	36	78	168
2	Vanden Road	N of Park	2	5	11	24	51
3	Vanden Road	S of Park	2	5	10	21	45
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	12	25	54	116	251
5	Vanden Road	Foxboro to Proposed City Limits	20	44	95	205	442
6	Vanden Road	S of Proposed City Limits	38	82	176	380	818
7	Alamo Drive	W of Interstate 80 EB Ramps	28	60	130	280	604
8	Alamo Drive	W of Marshall	29	64	137	295	635
9	Alamo Drive	W of Peabody	33	71	152	328	707
10	Alamo Drive	W of Nut Tree	31	67	145	312	673
11	Alamo Drive	W of Vanden	24	52	111	239	516
12	Alamo Drive	W of Leisure Town	20	43	94	202	434
13	Leisure Town Road	N of EB Ramps	62	135	290	624	1345
14	Leisure Town Road	N of Orange	59	127	273	587	1265
15	Leisure Town Road	N of Sequoia	50	107	231	498	1073
16	Leisure Town Road	N of Elmira	40	86	186	401	864
17	Leisure Town Road	N of Alamo	40	87	187	403	868
18	Leisure Town Road	S of Alamo	37	81	174	375	807
19	Leisure Town Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
20	Leisure Town Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
21	Leisure Town Road	E of Foxboro	29	63	136	294	634
22	Leisure Town Road	S of Foxboro	32	70	150	324	698
23	Nut Tree Road	N of Alamo	24	51	109	236	508
24	Nut Tree Road	S of Alamo	21	45	97	209	450

Appendix D-11

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension/Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
25	Nut Tree Road	N of Opal	8	16	35	75	162
26	Nut Tree Road	N of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
27	Nut Tree Road	S of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
28	Nut Tree Road	N of Foxboro	N/A	N/A	N/A	N/A	N/A
29	Peabody Road	North of Alamo	36	77	167	360	775
30	Peabody Road	S of Alamo	50	108	234	503	1085
31	Peabody Road	N of Foxboro	50	107	230	495	1067
32	Peabody Road	S of Foxboro	47	102	219	471	1015
33	Peabody Road	City Limits	43	94	202	434	936
34	Foxboro Parkway	West of Nut Tree	4	10	21	45	97
35	Foxboro Parkway	East of Nut Tree	6	13	29	63	135
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	6	13	29	63	135

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FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Vanden Road	S of Alamo	9	18	40	85	184
2	Vanden Road	N of Park	4	8	18	38	81
3	Vanden Road	S of Park	7	15	32	69	149
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	5	12	25	54	116
5	Vanden Road	Foxboro to Proposed City Limits	21	45	97	210	452
6	Vanden Road	S of Proposed City Limits	39	84	181	389	838
7	Alamo Drive	W of Interstate 80 EB Ramps	28	60	130	281	605
8	Alamo Drive	W of Marshall	30	65	140	302	650
9	Alamo Drive	W of Peabody	34	73	158	341	734
10	Alamo Drive	W of Nut Tree	33	71	154	332	715
11	Alamo Drive	W of Vanden	24	51	110	238	513
12	Alamo Drive	W of Leisure Town	19	41	89	191	412
13	Leisure Town Road	N of EB Ramps	58	124	267	575	1239
14	Leisure Town Road	N of Orange	59	128	275	593	1278
15	Leisure Town Road	N of Sequoia	51	109	235	506	1091
16	Leisure Town Road	N of Elmira	41	89	191	411	886
17	Leisure Town Road	N of Alamo	42	91	195	421	907
18	Leisure Town Road	S of Alamo	40	87	188	404	871
19	Leisure Town Road	N of Vanden Meadows Collector	32	70	150	323	696
20	Leisure Town Road	S of Vanden Meadows Collector	31	67	144	310	668
21	Leisure Town Road	E of Foxboro	31	67	144	310	668
22	Leisure Town Road	S of Foxboro	33	71	154	332	715
23	Nut Tree Road	N of Alamo	26	55	119	256	551
24	Nut Tree Road	S of Alamo	25	54	116	250	539

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FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future with Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
25	Nut Tree Road	N of Opal	14	30	64	137	296
26	Nut Tree Road	N of Vanden Meadows Collector	9	19	41	89	192
27	Nut Tree Road	S of Vanden Meadows Collector	6	14	30	64	138
28	Nut Tree Road	N of Foxboro	6	14	30	64	138
29	Peabody Road	North of Alamo	36	78	167	360	776
30	Peabody Road	S of Alamo	50	108	232	501	1079
31	Peabody Road	N of Foxboro	50	108	232	500	1076
32	Peabody Road	S of Foxboro	47	102	219	472	1017
33	Peabody Road	City Limits	44	94	202	435	937
34	Foxboro Parkway	West of Nut Tree	8	17	36	77	167
35	Foxboro Parkway	East of Nut Tree	12	25	54	117	252
36	Foxboro Parkway	W of Vanden Meadows Collector	11	25	53	114	246
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	14	29	63	136	293

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FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Vanden Road	S of Alamo	9	18	40	85	184
2	Vanden Road	N of Park	4	8	17	38	81
3	Vanden Road	S of Park	7	16	33	72	155
4	Vanden Road	N of Foxboro & S of Vanden Meadows Collector	7	14	30	66	141
5	Vanden Road	Foxboro to Proposed City Limits	21	45	97	209	451
6	Vanden Road	S of Proposed City Limits	39	83	180	387	835
7	Alamo Drive	W of Interstate 80 EB Ramps	28	60	130	281	604
8	Alamo Drive	W of Marshall	30	65	140	301	648
9	Alamo Drive	W of Peabody	34	73	158	340	733
10	Alamo Drive	W of Nut Tree	33	72	155	333	717
11	Alamo Drive	W of Vanden	24	52	112	241	519
12	Alamo Drive	W of Leisure Town	20	42	91	195	421
13	Leisure Town Road	N of EB Ramps	62	134	288	620	1335
14	Leisure Town Road	N of Orange	59	128	275	593	1278
15	Leisure Town Road	N of Sequoia	50	109	234	504	1086
16	Leisure Town Road	N of Elmira	41	88	190	410	883
17	Leisure Town Road	N of Alamo	42	90	195	420	905
18	Leisure Town Road	S of Alamo	40	86	186	401	863
19	Leisure Town Road	N of Vanden Meadows Collector	32	68	146	316	680
20	Leisure Town Road	S of Vanden Meadows Collector	30	66	141	304	655
21	Leisure Town Road	E of Foxboro	30	66	141	304	655
22	Leisure Town Road	S of Foxboro	33	71	153	331	712
23	Nut Tree Road	N of Alamo	25	55	118	253	546
24	Nut Tree Road	S of Alamo	25	55	118	253	546

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FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2011-011 Vanden Meadows Specific Plan & Dev. Project
Description: Future without Extension plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			------- Distances to Traffic Noise Contours -------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
25	Nut Tree Road	N of Opal	14	30	64	138	298
26	Nut Tree Road	N of Vanden Meadows Collector	9	20	44	94	203
27	Nut Tree Road	S of Vanden Meadows Collector	2	5	11	23	49
28	Nut Tree Road	N of Foxboro	2	5	11	23	49
29	Peabody Road	North of Alamo	36	78	169	363	782
30	Peabody Road	S of Alamo	50	107	231	499	1074
31	Peabody Road	N of Foxboro	49	107	230	495	1066
32	Peabody Road	S of Foxboro	47	102	219	473	1018
33	Peabody Road	City Limits	44	94	202	436	939
34	Foxboro Parkway	West of Nut Tree	3	6	12	27	57
35	Foxboro Parkway	East of Nut Tree	N/A	N/A	N/A	N/A	N/A
36	Foxboro Parkway	W of Vanden Meadows Collector	N/A	N/A	N/A	N/A	N/A
37	Foxboro Parkway	E of Vanden Meadows Collector and W of Vanden	12	26	56	120	259