Brentwood Boulevard Specific Plan

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Recirculated Draft Environmental Impact Report

Volume III of III
Appendices G-L

Prepared for
the City of Brentwood

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Prepared by

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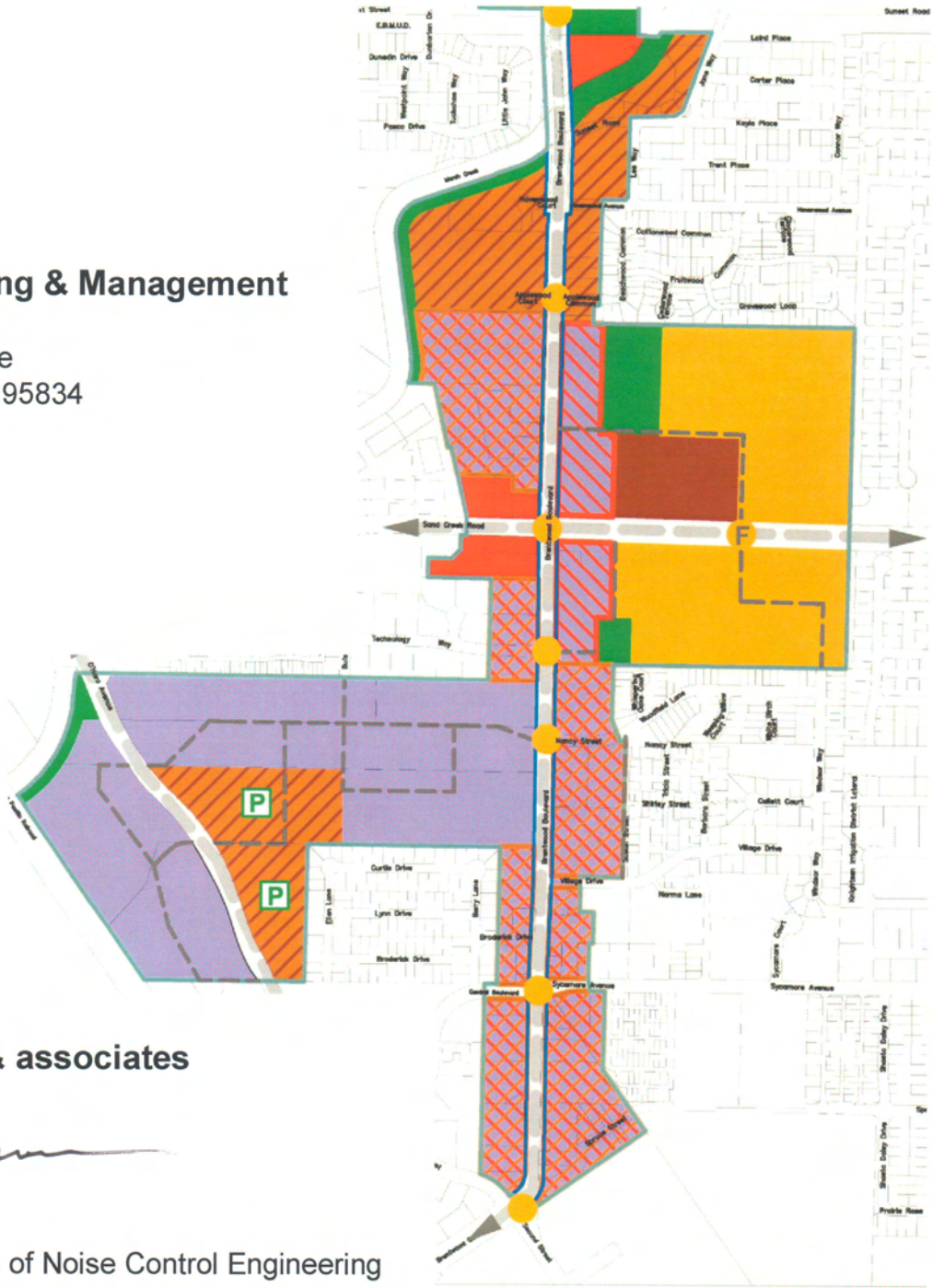
APPENDIX G

Brentwood Boulevard Specific Plan
Environmental Noise Assessment
Brentwood, California



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NOISE

INTRODUCTION

This report has been prepared to address the noise impacts due to and upon the proposed Brentwood Boulevard Specific Plan, which is located within the City of Brentwood, California. The Brentwood Specific Plan project area is located along the primary roadway corridor which is currently State Route 4 (S.R. 4). The project area is bounded by Delta Road to the north and Second Street to the south. See Figure 4.4-1 for the project area.

This section discusses the existing and future noise environment in the immediate project vicinity, and identifies potential impacts do to and upon the Project and applies mitigation measures were necessary.

Project Description

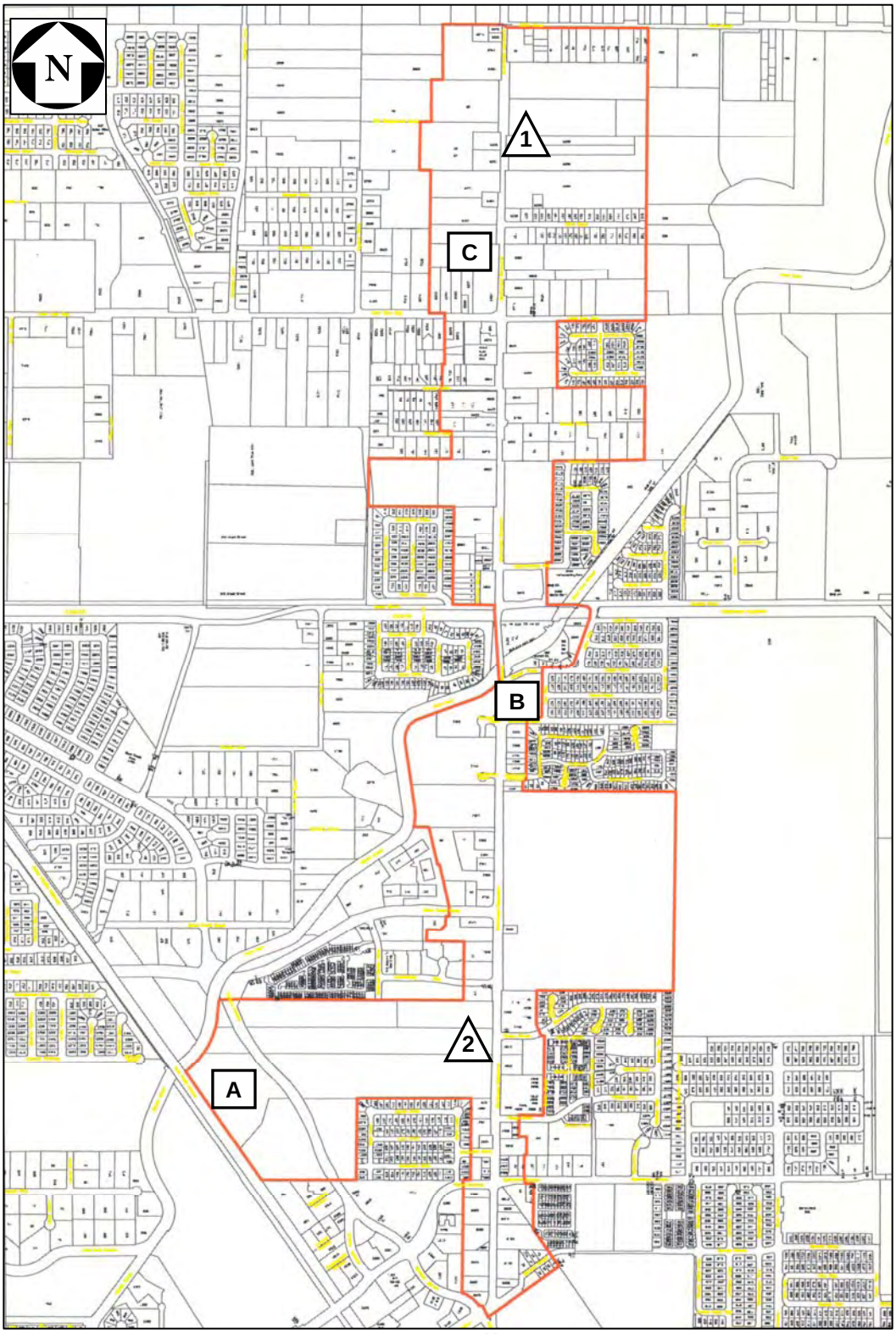
The following is a brief description of the physical components of the Brentwood Specific Plan:

The Brentwood Boulevard Specific Plan area consists primarily of parcels with frontage directly on Brentwood Boulevard from Delta Road to Second Street, at the northern edge of Downtown Brentwood. Other parcels within the proposed project site do not have frontage on Brentwood Boulevard. The majority of these parcels located east of Brentwood Boulevard are along Delta Road, Sims Road, Lone Tree Way, Beverly Place, Sycamore Avenue, and Spruce Street. The majority of the parcel is without Brentwood Blvd frontage, west of Brentwood Boulevard and located along Lone Tree Way, Sunrise Drive, Gregory Lane, Almond Street, and O'Hara Avenue.

The Specific Plan would include approximately 8,300 retail, office, and industrial jobs and up to 2,663 residential dwelling units, of various densities, on approximately 396 acres. The majority of the residential acreage, 80.7 acres, is comprised of Neighborhood Boulevard Density Residential. The proposed Plan also includes 18.4 acres of Low Density Residential, 45.7 acres of Medium Density Residential, seven acres of Very High Density Residential, and 21.5 acres of residential development as part of the project's Mixed-Use component. In addition, the proposed project area would include 35.4 acres of land designated for Industrial uses, 19.2 acres of designated Retail uses, 123.4 acres of designated Office Commercial uses, and at least 8.1 acres of Open Space and Parks.

The proposed project area is divided into three sub-areas, which run from the northern boundary of the project area to the southern boundary of the project area, and are designated by the streets that bound each of the sub-areas. The three sub-areas, which would each include a mix of land uses, are referred to as the Northern, Central, and Southern sub-areas. The Northern sub-area (Delta Road to Lone Tree Way) would consist primarily of planned Office Commercial and Industrial land; the Central sub-area (Lone Tree Way to Havenwood Court/Avenue) would consist primarily of Residential land (various densities), planned Retail, and Open Space; and the Southern sub-area (Havenwood Court/Avenue to Second Street) would consist primarily of Mixed-Use, Office Commercial, Residential land (various densities), and Open Space.

Figure 4.4-1
Brentwood Boulevard Specific Plan
Project Area Map &
Noise/Vibration Measurement Locations



△ : Vibration Measurement Locations

□ : Continuous Noise Measurement Locations

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ACOUSTIC TERMINOLOGY[1]

Background Information on Noise and Vibration

Fundamentals of Acoustics

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective: one person's music is another's headache.
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), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this 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, and changes in levels (dB) correspond closely to human perception of relative loudness.
The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

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 environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, 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

[1] For an explanation of these terms, see Appendix 4.4-A: "Acoustical Terminology"

a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 4.4-1 lists several examples of the noise levels associated with common situations.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Table 4.4-1 Typical Noise Levels		
Common Outdoor Activities	**Noise Level (dBA)**	**Common Indoor Activities**
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source:Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. October 1998.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

Fundamentals of Groundborne Vibration

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 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 object which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibrations in terms of peak particle velocities using units of inches per second. Certain construction-related activities, such as pile driving, may generate substantial vibration levels. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between the source and receptor, duration, and the number of perceived vibration events.

Table 4.4-2 indicates that the threshold for damage to structures ranges from 2 to 6 in/sec. One-half this minimum threshold or 1 in/sec peak particle velocity (PPV) is considered a safe criterion that would protect against architectural or structural damage. The threshold of human annoyance is considered to be 0.1 in/sec. However, depending on the activity (or inactivity) a person is engaged in, vibrations may be annoying at much lower levels than those shown in Table 4.4-2. Elderly, retired, or ill people staying mostly at home, people reading in a quiet environment, people involved in vibration sensitive hobbies or other activities are but a few examples of people that are potentially annoyed by much lower vibration levels. To people in this category, even vibrations near the threshold of perception may be annoying. Therefore, one-half of the threshold of human annoyance, or .05 in/sec PPV, is considered a reasonable criterion that would protect against human annoyance in most cases.

Table 4.-2
General Human and Structural Responses to Vibration Levels

Effects on Structures & People	Peak Vibration Threshold (in/sec PPV)
Structural damage to commercial structures	6
Structural damage to residential buildings	2
Architectural damage	1.0
General threshold of human annoyance	0.1
General threshold of human perception	0.01

Sources: Survey of Earth-borne Vibrations due to Highway Construction and Highway Traffic, Caltrans 1976.
Final Environmental Impact Report: Richmond Transport Project, Orion Environmental Associates, 1990.
Weekly Progress Report for Vibration Monitoring for Richmond Transport, Wilson, Ihrig & Associates, 1994

Major Noise Sources in the Project Vicinity

Transportation:

Vehicle traffic on Brentwood Boulevard (S.R. 4) and the local street system is one of the primary noise sources within the project site. Since Brentwood Boulevard is a primary east/west state highway which connects the East Bay area with the major cities to the east, it is also a primary truck route. Currently, the S.R. 4 Bypass is under the final stages of construction. The future bypass is expected to divert through traffic from Brentwood Boulevard. The traffic consultant has estimated that reduction in traffic volumes of 20% will occur along Brentwood Boulevard. This would result in a decrease in overall noise levels along Brentwood Boulevard of approximately 1 dB Ldn.

The UPRR railroad line is currently borders the southwest portion of the project site. Based upon field observations and noise measurement data collected on the project site which will be described later in this report, the adjacent UPRR line does not appear to be in use. This portion of the railroad line has not been in use since prior to the year 2000. Further research indicates that the Mountain House Community Master Plan EIR, which is to the southeast along the same UPRR line, indicates that the line is a standby route with no contemplated use for freight movement. However, there are indications that future use of the line could be used for commuter passenger service or future freight service.

Non-Transportation:

Commercial and industrial land uses along the Brentwood Boulevard corridor which inherently have noise producing components associated with their operations include storage yards, ware houses, automotive wrecking services, automotive repair, shopping centers, tire shops, automotive sales, lumber yards and car washes.

Noise sources associated with these types of land uses include, but are not limited to:

HVAC Systems	Cooling Towers/Evaporative Condensers
Loading Docks	Lift Stations
Emergency Generators	Pneumatic Tools
Steam Valves	Generators
Air Compressors	Heavy Equipment
Conveyor Systems	Transformers
Cutting Equipment	Outdoor Speakers
Fans	Welding Equipment

Major Vibration Sources in the Project Vicinity

Traffic along Brentwood Boulevard may be considered a primary source of ground borne vibrations in the immediate vicinity of the project site. If train operations were to occur along the UPRR track, vibration levels associated with railroad operations could also be a source of vibration levels.

Noise-Sensitive Land Uses in the Project Vicinity

Noise sensitive land uses in the immediate project vicinity consist of a single-family and multi-family residential, churches, assisted care/convalescent home, and to some extent office uses.

Existing Noise Environment in the Project Vicinity

Existing Traffic Noise Levels

To determine the existing traffic noise levels at noise sensitive land uses within the project vicinity, j.c. brennan & associates, Inc. employed the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-77-108). 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. The FHWA model inputs consisted of existing PM peak traffic volumes obtained from the traffic study prepared for this project, and j.c. brennan & associates, Inc., site observations, and Caltrans K factors. A compete listing of the FHWA model inputs is provided in Appendix 4.4-B.

Table 4.4-3 shows the predicted existing traffic noise levels in terms of the Day/Night Average Level descriptor (Ldn) at a standard distance from the centerlines of the existing immediate project-area roadways for existing conditions, as well as distances to existing traffic noise contours. The extent by which existing land uses in the project vicinity are affected by existing traffic noise depends on their respective proximity to the roadways and their individual sensitivity to noise.

Table 4.4-3
Existing No Project Traffic Noise Levels

Roadway	Segment	Distance[1]	Traffic Noise Level, Ldn (dBA)	Distance to Contours (feet)		
				70 Ldn	65 Ldn	60 Ldn
Brentwood Blvd.	North of Delta	100	66.3	57	123	265
Brentwood Blvd.	Delta to Sims	100	66.5	58	125	270
Brentwood Blvd.	Sims to Lone Tree	100	66.6	59	127	274
Brentwood Blvd.	Lone Tree to Sunrise	100	65.6	51	110	237
Brentwood Blvd.	Sunrise to Gregory	100	67.3	67	143	309
Brentwood Blvd.	Gregory to Hanson	100	67.2	65	141	304
Brentwood Blvd.	Hanson to Homecoming	100	67.0	63	135	292
Brentwood Blvd.	Homecoming to Grant	100	67.1	64	138	298
Brentwood Blvd.	Grant to Sunset	100	67.2	65	139	300
Brentwood Blvd.	Sunset to Havenwood	100	67.4	67	145	312
Brentwood Blvd.	Havenwood to Applewood	75	69.5	70	150	324
Brentwood Blvd.	Applewood to Sand Creek	75	69.7	71	154	331
Brentwood Blvd.	Sand Creek to Technology	75	68.2	57	122	263
Brentwood Blvd.	Technology to Nancy	75	68.1	56	121	261
Brentwood Blvd.	Nancy to Village	75	68.2	57	122	264
Brentwood Blvd.	Village to Central / Sycamore	75	68.2	57	123	264
Brentwood Blvd.	Central / Sycamore to Spruce	75	67.3	50	107	230
Brentwood Blvd.	Pine to Maple	75	66.3	42	91	197
Brentwood Blvd.	Maple to Oak	75	66.2	42	90	194

Table 4.4-3
Existing No Project Traffic Noise Levels

Roadway	Segment	Distance[1]	Traffic Noise Level, Ldn (dBA)	Distance to Contours (feet)		
				70 Ldn	65 Ldn	60 Ldn
Brentwood Blvd.	Oak to Second	75	65.6	38	83	178
Brentwood Blvd.	Second to Chestnut	75	66.2	42	90	195
Brentwood Blvd.	Chestnut to Balfour	75	65.5	38	81	175
Brentwood Blvd.	South of Balfour	75	67.6	52	111	240
Delta Road	West of Brentwood	100	--	--	--	--
Delta Road	East of Brentwood	100	57.0	14	29	63
Delta Road	West of Sellers	100	56.7	13	28	61
Delta Road	East of Sellers	100	55.8	11	24	53
Sellers Ave.	North of Delta	100	57.9	16	33	72
Sellers Ave.	South of Delta	100	58.8	18	39	83
Lone Tree Way	West of Brentwood	100	58.8	18	39	83
Lone Tree Way	East of Brentwood	100	50.4	5	11	23
Sunrise Drive	West of Brentwood	100	47.4	3	7	15
Gregory Lane	West of Brentwood	100	50.0	5	10	22
Hanson Lane	East of Brentwood	100	49.7	4	10	21
Homecoming Way	East of Brentwood	100	41.2	1	3	6
Grant/Sunset	West of Brentwood	100	55.7	11	24	52
Grant/Sunset	East of Brentwood	100	59.1	19	40	87
Havenwood Ave.	West of Brentwood	100	37.8	1	2	3
Havenwood Ave.	East of Brentwood	100	47.4	3	7	15
Applewood Common	West of Brentwood	100	43.2	2	4	8
Applewood Common	East of Brentwood	100	48.6	4	8	17
Sand Creek Road	West of Brentwood	100	59.7	20	44	95
Sand Creek Road	East of Brentwood	100	--	--	--	--
Technology Way	West of Brentwood	100	47.5	3	7	15
Nancy Street	West of Brentwood	100	--	--	--	--
Nancy Street	East of Brentwood	100	50.8	5	11	25
Village Drive	East of Brentwood	100	47.8	3	7	15
Central/Sycamore	West of Brentwood	100	57.7	15	33	71
Central/Sycamore	East of Brentwood	100	57.1	14	30	64
Second Street	South of Central	100	60.5	23	50	108
Central Blvd.	West of Second	100	58.2	16	35	75
Central Blvd.	East of Second	100	59.2	19	41	88
Central Blvd.	West of Walnut	100	59.6	20	44	95
Central Blvd.	East of Walnut	100	61.3	26	56	122
Walnut Blvd.	South of Central	100	57.9	16	34	72
Pine Street	East of Brentwood	100	47.3	3	7	14
Maple Street	West of Brentwood	100	--	--	--	--
Maple Street	East of Brentwood	100	46.0	3	5	12
Oak Street	West of Brentwood	100	58.8	18	39	84
Oak Street	East of Brentwood	100	56.7	13	28	60
Second Street	West of Brentwood	100	60.2	22	48	104
Second Street	East of Brentwood	100	58.3	17	36	77
Chestnut Street	East of Brentwood	100	48.8	4	8	18
Balfour Road	West of Brentwood	100	65.3	48	104	224
Balfour Road	East of Brentwood	100	62.3	31	66	143

Table 4.4-3 Existing No Project Traffic Noise Levels						
			Traffic	Distance to Contours (feet)		
Roadway	Segment	Distance[1]	Noise Level, Ldn (dBA)	70 Ldn	65 Ldn	60 Ldn
Sellers Ave.	North of Sunset	100	59.2	19	41	89
Sellers Ave.	South of Sunset	100	55.9	12	25	53
Sunset Road	West of Sellers	100	56.8	13	29	62
Sunset Road	East of Sellers	100	55.6	11	24	51
[1]Distances are reference distances from centerline of roadway. --Traffic volume was not available for this segment.						

Existing Brentwood Boulevard Vibration Levels

j.c. brennan & associates, Inc., conducted vibration measurements at two sites along Brentwood Boulevard. The vibration measurements were conducted to quantify the ground borne vibration levels attributed to vehicle traffic at the project site. The vibration measurements were conducted using a Larson-Davis HVM100 vibration meter. The meter was programmed to monitor vibrations in terms of peak particle velocities using units of inches per second. Table 4.4-4 shows the results of these measurements. Figure 4.4-1 shows the locations of the vibration measurement sites.

Table 4.4-4 Brentwood Boulevard Measured Existing Vibration Levels			
Location	Description	Vmax (in/sec PPV)	Veq (in/sec PPV)
50 Feet West of Brentwood Blvd.	Traffic	0.115	0.0196
50 Feet East of Brentwood Blvd	Traffic	0.110	0.0170
Source: j.c. brennan & associates, Inc., 2007			

Existing Ambient Noise Levels

To quantify existing ambient noise levels in the vicinity of the project site, j.c. brennan & associates, Inc., conducted continuous 24-hour noise level measurements at three locations within the project area, on August 1-2, 2007. The intent of the 24-hour continuous noise level measurements was to determine the existing Brentwood Boulevard traffic noise levels, and to determine the effective day/night distribution of traffic along Brentwood Boulevard. The results of continuous noise level measurements are shown in Table 4.4-5. In addition, the noise measurements were conducted to determine if the existing UPRR rail line was in use. Continuous noise monitoring results are presented graphically in Appendix C. The 24-hour continuous noise measurement site is shown on Figure 4.4-1.

Equipment used for the noise measurements included Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters. The meters were calibrated before and after use with an LDL CAL200 acoustical calibrator to ensure the accuracy of the measurements. The

measurement system meets all pertinent specifications of the American National Standards Institute (ANSI) for precision sound level measurement equipment.

Table 4.4-5
Existing Continuous Ambient Noise Monitoring Results
August 1-2, 2007

Site	Measured Ldn	Average Hourly Daytime (7:00am - 10:00pm)			Average Hourly Nighttime (10:00pm – 7:00am)		
		Leq	L50	Lmax	Leq	L50	Lmax
A	52.3 dB	50.6 dB	47 dB	63.5 dB	44.2 dB	43 dB	58.1 dB
B	69.2 dB	66.7 dB	64 dB	82.2 dB	61.6 dB	55 dB	77.1 dB
C	70.9 dB	68.3 dB	65 dB	85.4 dB	63.3 dB	50 dB	80.5 dB
Source: j.c. brennan & associates, Inc. - 2007							

A description of each of the noise measurement sites is as follows:

Site A:

This noise measurement site was located between Ohara Avenue and the UPRR track. The noise measurements were conducted at a distance of 117 feet from the railroad track centerline.

Site B:

This noise measurement site was located at the southeast corner of Sunset Court and Brentwood Boulevard. This is the property of Perez Nursery. The noise measurements were conducted at a distance of 50 feet from the Brentwood Boulevard centerline.

Site C:

This noise measurement site was located on the west side of Brentwood Boulevard, and across the street from Sims Road. The noise measurement site was 55 feet from the centerline of Brentwood Boulevard.

REGULATORY SETTING

City of Brentwood General Plan Noise Element:

The City of Brentwood General Plan Noise Element establishes goals and policies, as well as criteria for evaluating the compatibility of individual land uses with respect to noise exposure. The intent is to provide guidance for determining noise impacts due to, and upon proposed projects.

Goal 1: Protect noise-sensitive uses from the harmful and annoying effects of exposure to excessive noise.

Policy 1.1 – Transportation Noise: Protect residential, office and other noise-sensitive land uses from excessive transportation noise.

Action 1.1.1 – New Development: Require mitigation in new developments so that transportation noise exposure on site does not exceed the levels shown below.

Table 4.4-6
City of Brentwood Transportation Noise Source Criteria

Maximum Allowable Noise Exposure
Transportation Noise Sources

Land Use	Outdoor Activity Areas[1] Weighted Daily Average (dBA)[2]	Interior Spaces	
		Weighted Daily Average[2] dBA	Use period Average[3] dBA
Residences	60	45	--
Transient Lodging	60	45	--
Hospitals, Nursing Homes	60	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60	--	40
Office Buildings	60	--	45
Schools	60	--	45
Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

[1] Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.

[2] Using the Ldn or CNEL noise scale

[3] Leq, as determined for a typical worst-case hour during periods in which the facility is used (e.g. school is in session)

[4] Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn/CNEL, or less using a practical application of the best available noise reduction measures, an exterior noise level of up to 65 dB Ldn/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

Action 1.1.2 – Existing Development: Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Action 1.1.1 at existing sensitive land uses.

Action 1.1.3 - Acoustical Analysis: An acoustical analysis shall be prepared for projects that may produce or be exposed to noise levels exceeding the standards of Action 1.1.1 This acoustical analysis shall:

A. Be the responsibility of the applicant.
B. Be prepared by a qualified acoustical analyst
C. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions and the predominant noise sources.
D. Estimate existing and projected (20 years) noise levels in terms of Ldn or CNEL,hourly Leq, and/or maximum noise level and compare these levels to the adopted criteria.
E. Recommend mitigation to comply with the adopted policies and standards of the Noise Element. Where the noise source in question consists of intermittent single events, the report must address the effects of maximum noise levels in sleeping rooms in terms of possible sleep disturbance.
F. Estimate noise exposure after the prescribed mitigation measures have been implemented.
G. Describe a monitoring program to evaluate the effectiveness of the proposed mitigation measures.

Policy 1.2 – Industrial-Related Noise: Industrial and other non-transportation noise sources shall be mitigated to an acceptable standard.

Action 1.2.1 – Performance Standards: New non-transportation noise sources including uses such as concrete plants, generators, and compressors and excluding agricultural operations on appropriately zoned lands, shall not exceed the following levels at the property line of lands designated for noise-sensitive uses:

Table 4.4-7
City of Brentwood Stationary Noise Source Criteria

Maximum
Industrial-Related Noise Levels

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Average (Leq, dBA)	50	45
Maximum Level (dBA)	70	65

Action 1.2.2 – Acoustical Analysis: An acoustical analysis shall be performed for projects that may produce or be exposed to noise levels exceeding the standards in Action 1.2.1 The acoustical analysis shall meet the standards specified in Action 1.1.3

Action 1.2.3 – Protect Existing Uses: Discourage the siting of new development on property that is subject to noise levels in excess of the standards shown in Actions 1.1.1 and 1.2.1.

Action 1.2.4 – Ordinance: The City of Brentwood shall adopt a noise control ordinance establishing standards for the enforcement of this Noise Element, regulation of highly annoying noise sources, and regulation of residential noise environments.

1.2.5 – Construction: Construction activities near sensitive land uses should be limited to the hours of 9 a.m. to 7 p.m. on weekdays and 8 a.m. to 7 p.m. on Saturdays. Construction shall be prohibited on Sundays.

Goal 2: Preserve the rural noise environment of the City and surrounding areas.

Policy 2.1 – Site Design: Noise mitigation shall emphasize site planning and project design rather than noise barriers.

Action 2.1.1 – State Standards: Enforce the State Noise Insulation Standards (California Code of Regulations, Title 24) and Chapter 35 of the Uniform Building Code (UBC)[1].

Action 2.1.2 – Building Placement: Encourage the placement of noise tolerant land uses such as open space buffers and parking lots between noise sources and sensitive receptors.

Action 2.1.3 – Architecture: Encourage development architecture that places noise-sensitive rooms away from major roadways.

Action 2.1.4 – Soundwalls: The use of soundwalls along thoroughfares is often necessary to maintain noise standards. However, the City's preferred method of attenuating adverse noise levels is to utilize a combination of frontage roads, earth berming and larger building setbacks along thoroughfares in new subdivision design.

When soundwalls must be constructed, they should be designed in a meandering pattern and setback a minimum average distance of 10 feet from the adjacent right-of-way with extensive landscaping in front of the wall.

Determination of a Significant Increase in Noise Levels

Another means of determining a potential noise impact is to assess a person's reaction to changes in noise levels due to a project. Table 4.4-8 is commonly used to show expected public reaction to changes in environmental noise levels. This table was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 dBA, as this is the usual range of voice and interior noise levels.

[1] State Noise Insulation Standards are now contained in Section 1207 of the California building Code rather than Chapter 35 of the Uniform Building Code (UBC).

Table 4.4-8 Subjective Reaction to Changes in Noise Levels of Similar Sources		
Change in Level, dBA	Subjective Reaction	Factor Change in Acoustical Energy
1	Imperceptible (Except for Tones)	1.3
3	Just Barely Perceptible	2.0
5	Clearly Perceptible	3.2
6	Clearly Noticeable	4.0
10	About Twice (of half) as Loud	10.0
Source: Architectural Acoustics, M. David Egan, 1988.		

Criteria for Acceptable Vibration

The City of Brentwood General Plan Noise Element does not contain specific policies pertaining to vibration levels. Because the project site is located adjacent to a railroad line, the effects of transportation-induced vibration are considered in this analysis.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 4.4-10, created by Caltrans, indicates that the threshold for damage to structures ranges from 2 to 6 in/sec. One-half this minimum threshold or 1 in/sec peak particle velocity (PPV) is considered a safe criterion that would protect against architectural or structural damage. The threshold of human annoyance is considered to be 0.1 in/sec. However, depending on the activity (or inactivity) a person is engaged in, vibrations may be annoying at much lower levels those shown in Table 4.4-10. Elderly, retired, or ill people staying mostly at home, people reading in a quiet environment, people involved in vibration sensitive hobbies or other activities are but a few examples of people that are potentially annoyed by much lower vibration levels. To people in this category, even vibrations near the threshold of perception may be annoying. Therefore, one-half of the threshold of human annoyance, or .05 in/sec PPV, is considered a reasonable criterion that would protect against human annoyance in most cases.

Table 4.4-10
Effects of Various Vibration Levels on People and Buildings

Peak Particle Velocity		Human Reaction	Effect on Buildings
inches/second	mm/second		
0 -.006	0.15	Imperceptible by people	Vibrations unlikely to cause damage of any type
.006 -.02	0.5	Range of Threshold of perception	Vibrations unlikely to cause damage of any type
.08	2.0	Vibrations clearly perceptible	Recommended upper level of which ruins and ancient monuments should be subjected
0.1	2.54	Level at which continuous vibrations begin to annoy people	Virtually no risk of architectural damage to normal buildings
0.2	5.0	Vibrations annoying to people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
1.0	25.4		Architectural Damage
2.0	50.4		Structural Damage to Residential Buildings
6.0	151.0		Structural Damage to Commercial Buildings

Source: Survey of Earth-borne Vibrations due to Highway Construction and Highway Traffic, Caltrans 1976, 2002.

IMPACTS AND MITIGATION MEASURES

Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local planning criteria or ordinances, or substantially increase noise levels at noise-sensitive land uses.

Standards of Significance

CEQA guidelines state that implementation of the project would result in significant noise impacts if the project would result in either of the following:

a. Exposure of persons to or generation of noise levels in excess of standards established in the City of Brentwood General Plan. Specifically, exterior and interior noise levels of 60 dB Ldn and 45 dB Ldn, respectively, for residential uses exposed to transportation noise sources and the Table 4.4-7 standards for residential uses exposed to stationary noise sources.

b. Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels. Specifically, a threshold of 1 in/sec p.p.v. is considered a safe criterion that would protect against architectural or structural damage.

c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, typically defined as greater than 5 dB.

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, typically defined as greater than 5 dB.

e. For a project located within an airport land use plan or, where such a plan has not be adopted, within two miles of a public airport or public use airport, where the project would expose people residing or working in the area to excessive noise levels.

f. For a project within the vicinity of a private airstrip, where the project would expose people residing or working in the project area to excessive noise levels.

For this project, the significance of anticipated noise effects are based on a comparison between predicted noise levels and noise criteria defined by the City. For this project, noise impacts are considered significant if the proposed noise sensitive land uses would be exposed to noise levels in excess of the Noise Element standards as described earlier in this report, or if the project results in a traffic noise level increase of 5 dB or greater, consistent with Table 4.4-8 of this report.

This project site is not located within the environs of an airport.

NOISE IMPACT ASSESMENT METHODOLOGY

Traffic Noise Impact Assessment Methodology

To assess noise impacts due to project-related traffic increases on the existing local roadway network, traffic noise levels are predicted at a representative distance for baseline, baseline + project, cumulative, and cumulative + project scenarios).

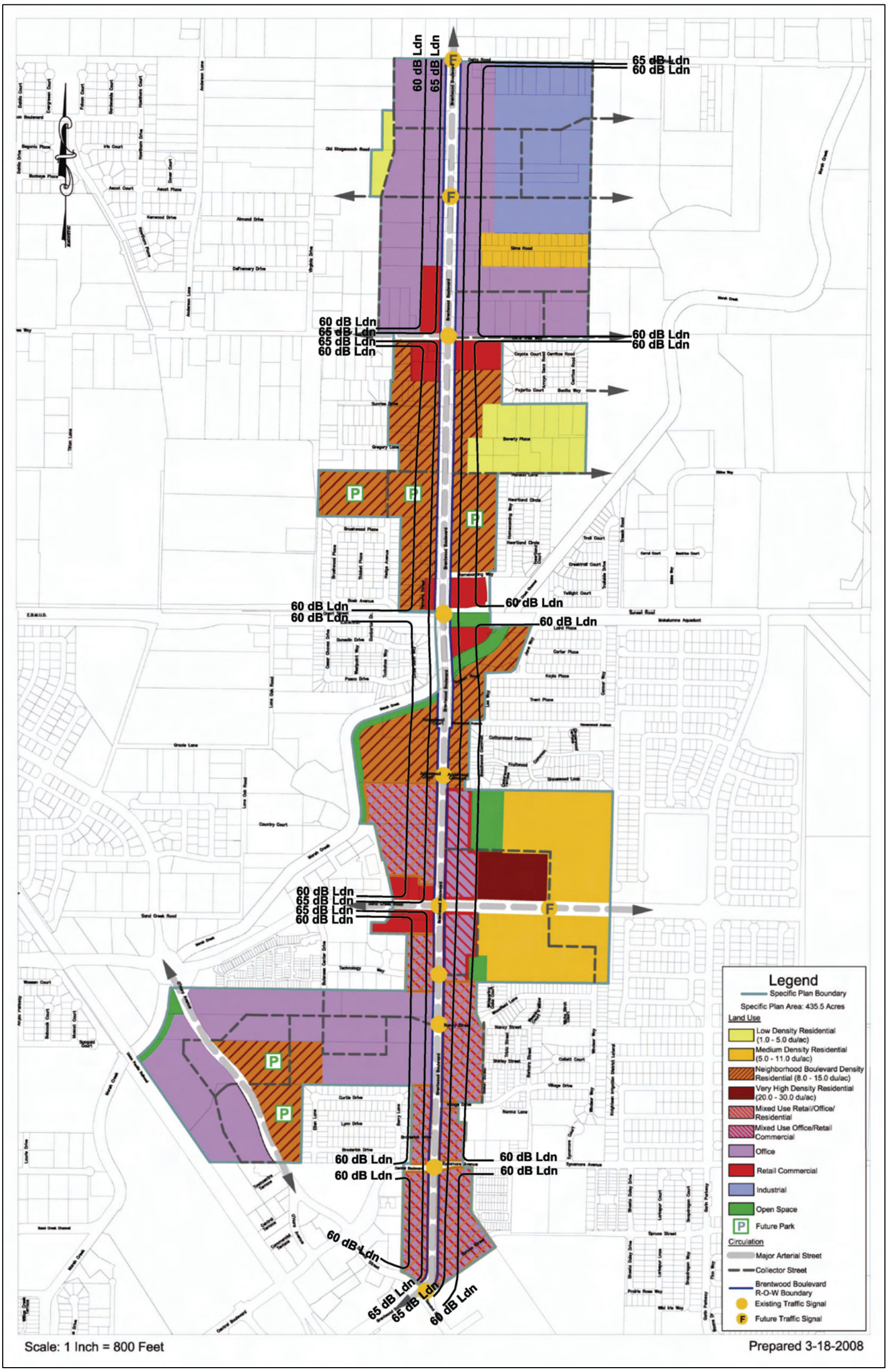
In order to assess the potential for noise impacts at future development along the Brentwood Blvd. corridor, j.c. brennan & associates, Inc. calculated exterior noise levels at a distance of approximately 25-30 feet outside of the Brentwood Blvd. Right-of-Way. The intent of this process was to approximate exterior noise levels at typical setback distances, accounting for the 15’ foot minimum setback requirement specified in the City of Brentwood Residential Design Guidelines.

j.c. brennan & associates, Inc. again utilized the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-77-108) to predict project traffic noise levels at a reference distance of 75-100 feet from the roadway centerlines. Table 4.4-11 shows the predicted traffic noise level increases on the local roadway network for the baseline and baseline + project conditions. Table 4.4-12 shows the predicted traffic noise level increases on the local roadway network for the Cumulative and Cumulative + Project conditions. Figures 4.4-2 through 4.4-6 show the predicted traffic noise contours for each scenario. Appendices 4.4-D through 4.4-G provide the complete inputs and results to the FHWA model for each of the traffic scenarios.

Figure 4.4-2

Existing Noise Contours

Brentwood Boulevard Specific Plan – City of Brentwood, California



: Predicted Traffic Noise Contours

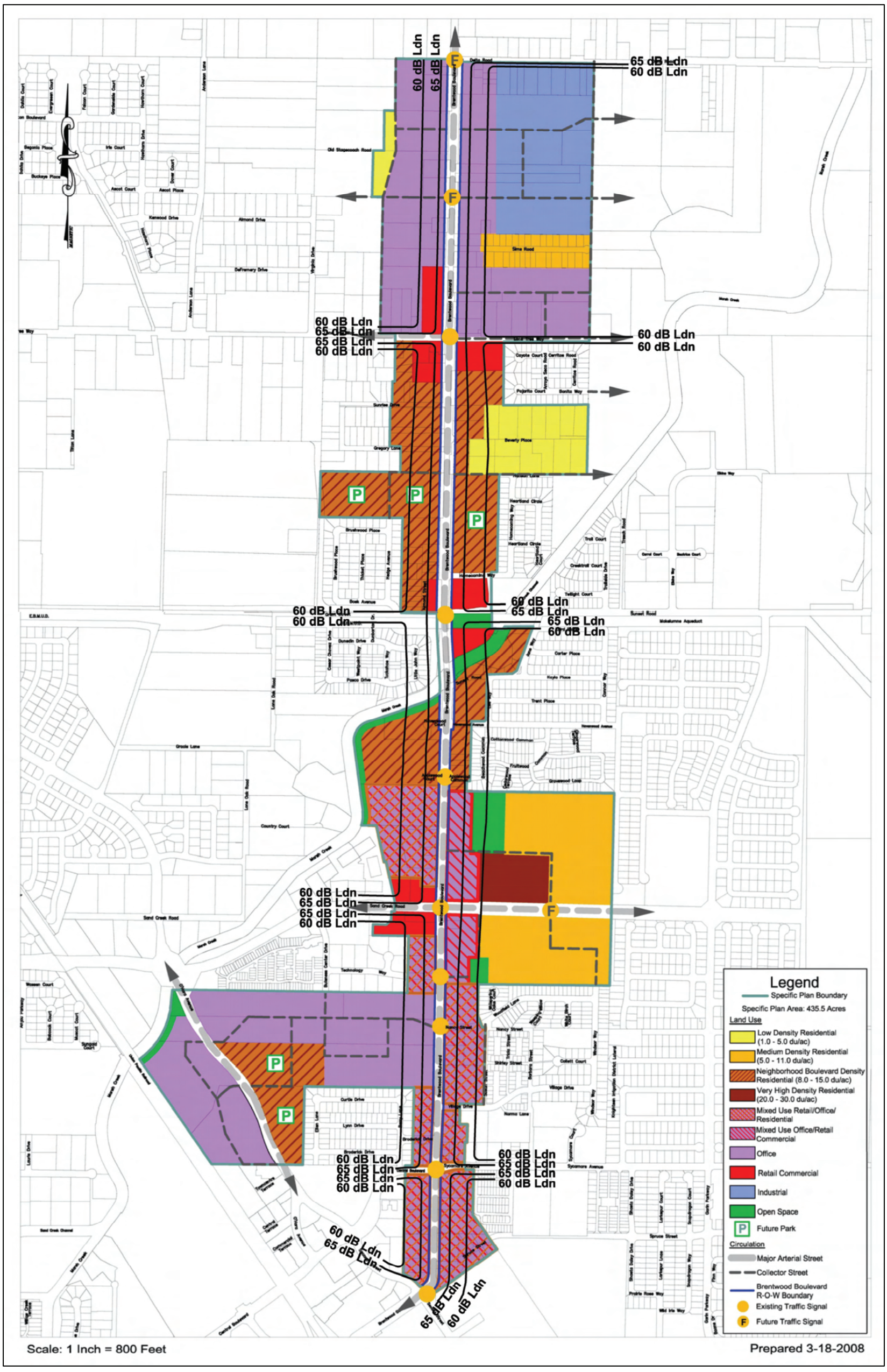
Note: Traffic noise contours are generalized and do not account for localized shielding which may occur due to existing structures or sound walls.

j.c. brennan & associates
consultants in acoustics

Figure 4.4-3

Baseline Noise Contours

Brentwood Boulevard Specific Plan – City of Brentwood, California



: Predicted Traffic Noise Contours

Note: Traffic noise contours are generalized and do not account for localized shielding which may occur due to existing structures or sound walls.

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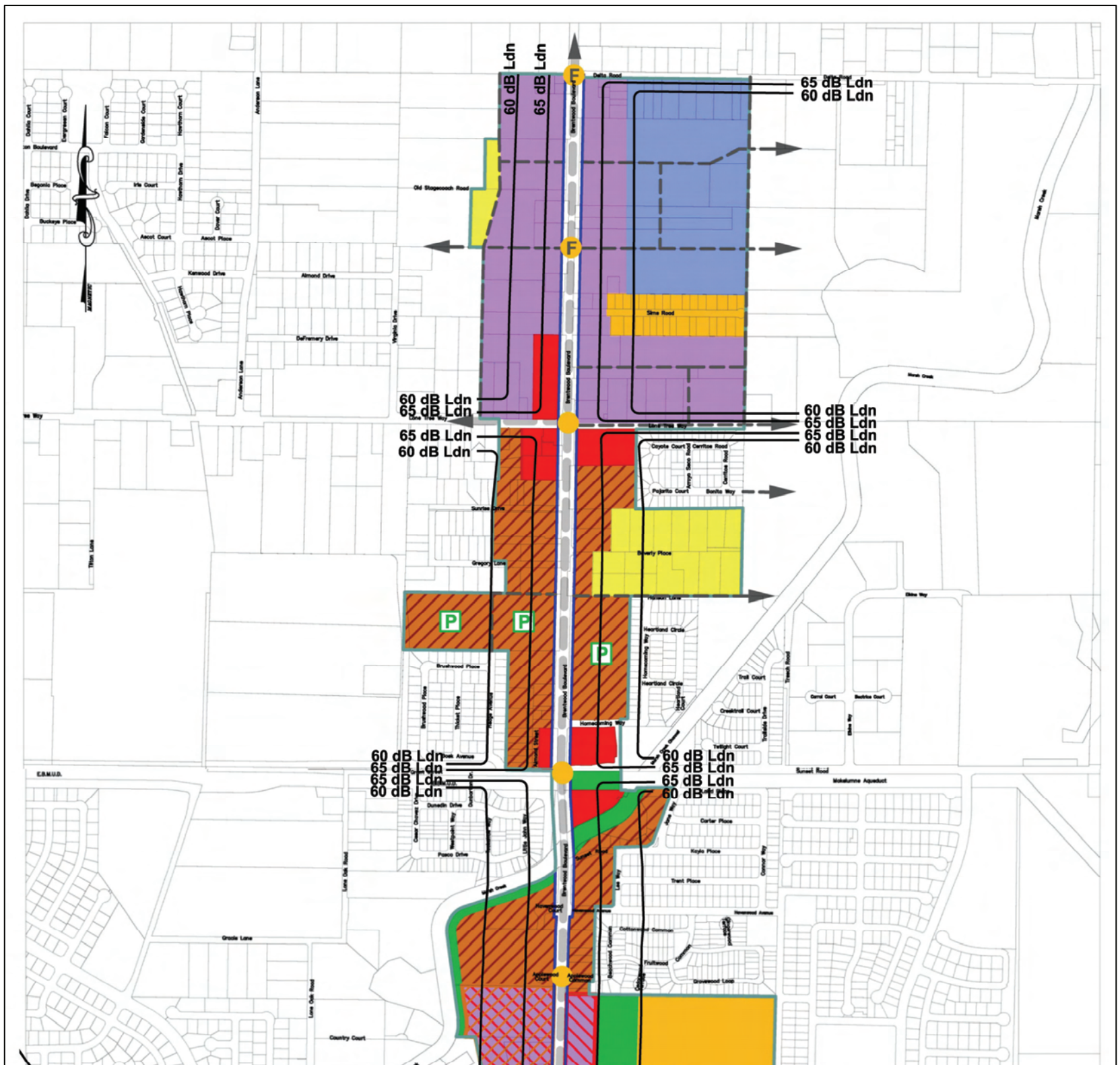
Figure 4.4-4

Baseline Plus Project Noise Contours

Brentwood Boulevard Specific Plan – City of Brentwood, California



: Predicted Noise Contours

Note: Traffic noise contours are generalized and do not account for localized shielding which may occur due to existing structures or sound walls.

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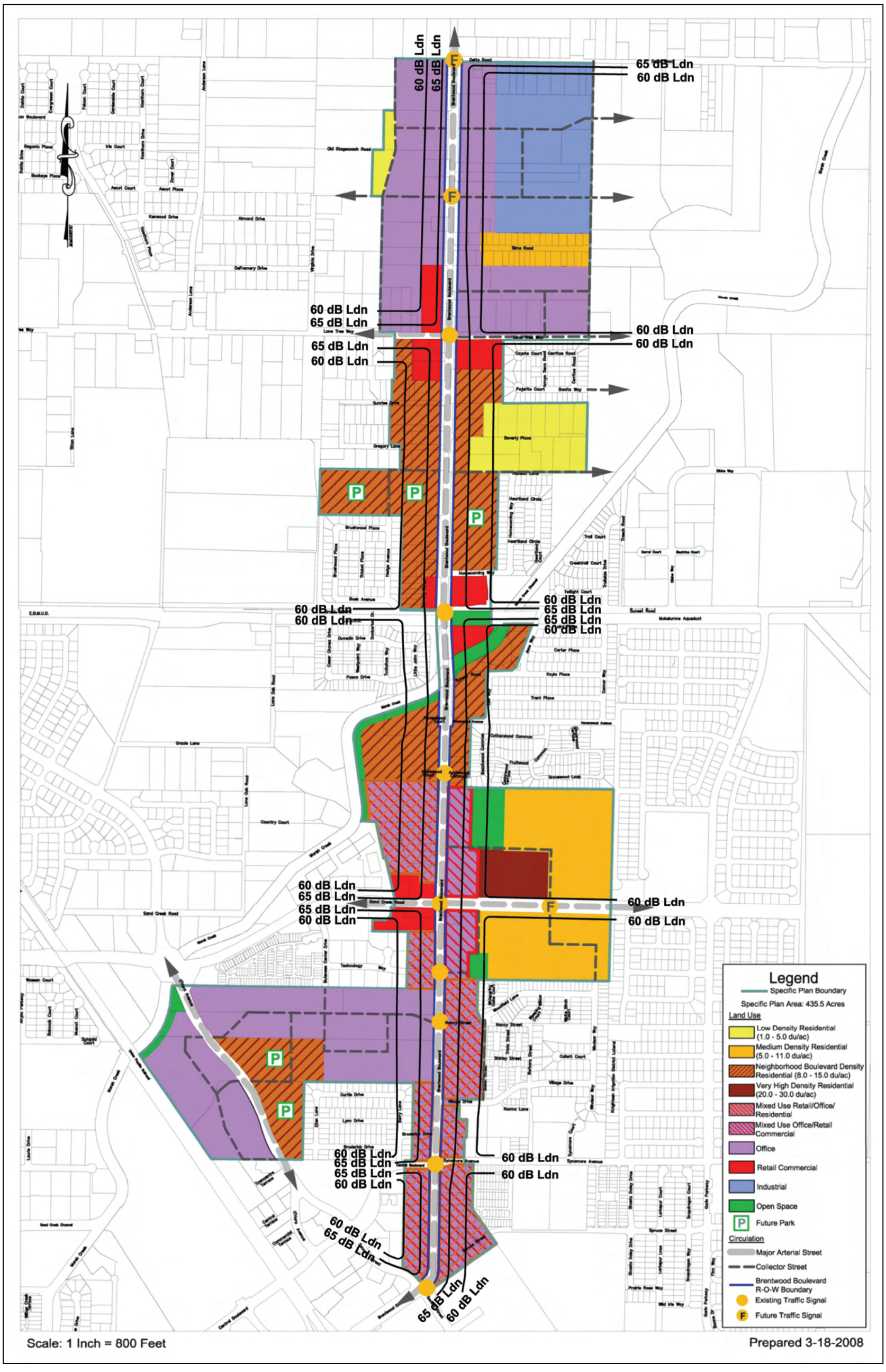
consultants in acoustics

Figure 4.4-5

Cumulative Noise Contours

Brentwood Boulevard Specific Plan – City of Brentwood, California



: Predicted Traffic Noise Contours

Note: Traffic noise contours are generalized and do not account for localized shielding which may occur due to existing structures or sound walls.

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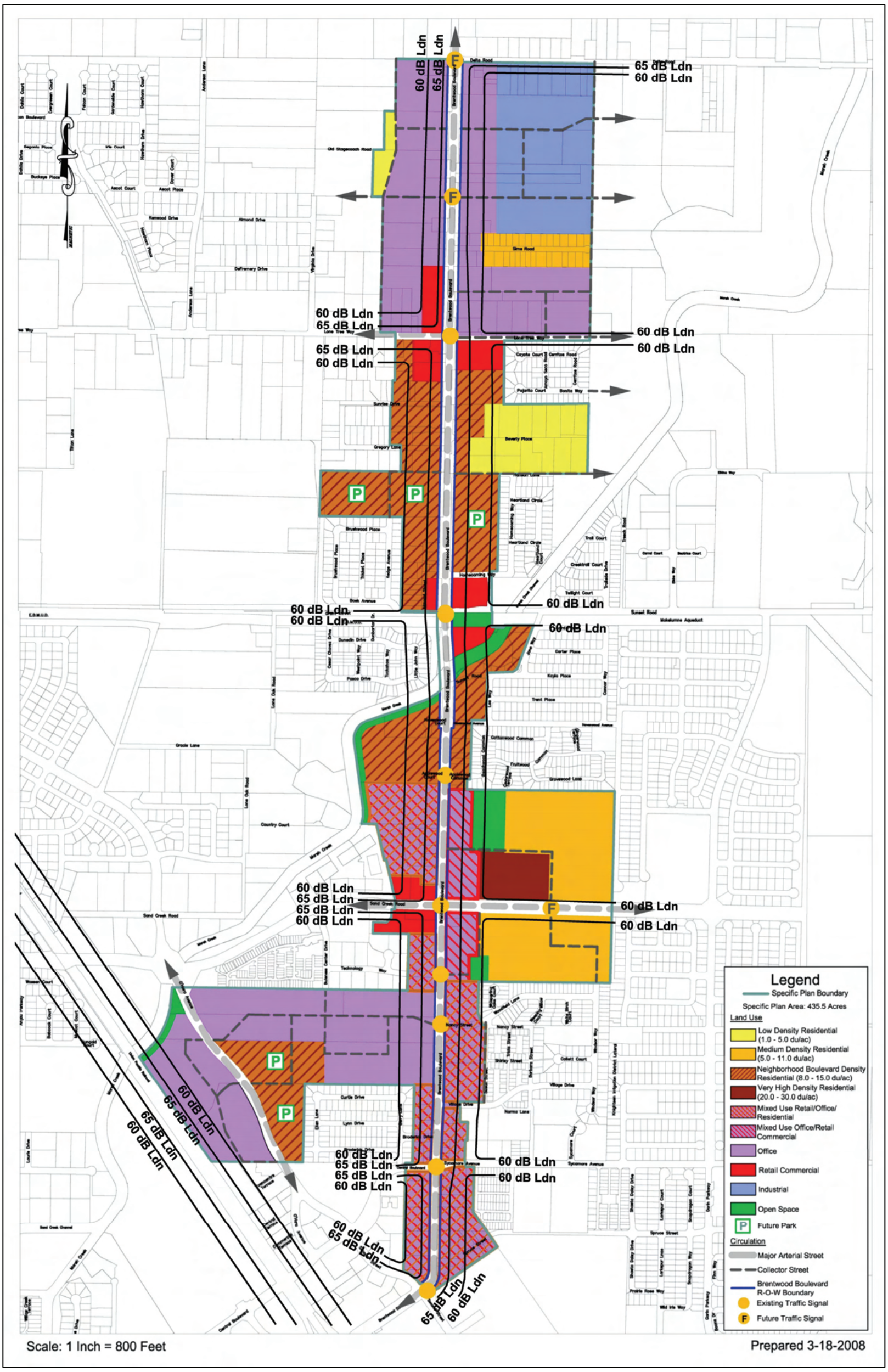
Figure 4.4-6

Cumulative Plus Project Noise Contours

Brentwood Boulevard Specific Plan – City of Brentwood, California



: Predicted Noise Contours

Note: Traffic noise contours are generalized and do not account for localized shielding which may occur due to existing structures or sound walls.

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Table 4.4-11
Predicted Baseline and Baseline + Project Traffic Noise Levels

			Traffic Noise Levels (Ldn dBA)			Distance to contours (feet) Baseline			Distance to Contours (feet) Baseline + Project		
Roadway	Segment	Distance	Baseline	Baseline + Project	Change	70 Ldn	65 Ldn	60 Ldn	70 Ldn	65 Ldn	60 Ldn
Brentwood Blvd.	North of Delta	100	67.2	68.9	1.7	65	140	302	85	182	393
Brentwood Blvd.	Delta to Sims	100	67.3	69.5	2.2	66	142	306	93	200	432
Brentwood Blvd.	Sims to Lone Tree	100	67.4	70.0	2.6	67	145	313	100	215	463
Brentwood Blvd.	Lone Tree to Sunrise	100	67.3	70.6	3.3	66	142	306	110	237	510
Brentwood Blvd.	Sunrise to Gregory	100	68.6	71.3	2.7	80	173	372	121	261	563
Brentwood Blvd.	Gregory to Hanson	100	68.5	71.2	2.7	80	171	369	121	260	561
Brentwood Blvd.	Hanson to Homecoming	100	68.3	71.2	2.9	78	167	360	119	257	554
Brentwood Blvd.	Homecoming to Grant	100	68.5	71.2	2.7	79	170	367	121	260	560
Brentwood Blvd.	Grant to Sunset	100	68.6	71.3	2.7	80	173	372	122	263	567
Brentwood Blvd.	Sunset to Havenwood	100	68.7	71.4	2.7	83	178	383	124	267	575
Brentwood Blvd.	Havenwood to Applewood	75	70.8	73.4	2.6	85	184	396	127	273	588
Brentwood Blvd.	Applewood to Sand Creek	75	71.0	73.5	2.5	87	188	406	128	276	595
Brentwood Blvd.	Sand Creek to Technology	75	69.9	72.1	2.2	74	159	342	103	223	480
Brentwood Blvd.	Technology to Nancy	75	69.9	72.0	2.1	74	159	342	102	219	473
Brentwood Blvd.	Nancy to Village	75	70.0	71.9	1.9	75	161	348	100	215	463
Brentwood Blvd.	Village to Central / Sycamore	75	70.0	71.8	1.8	75	162	348	99	213	458
Brentwood Blvd.	Central / Sycamore to Spruce	75	68.9	70.6	1.7	63	136	294	82	177	380
Brentwood Blvd.	Pine to Maple	75	67.8	69.4	1.6	54	116	249	69	148	319
Brentwood Blvd.	Maple to Oak	75	67.7	69.3	1.6	52	113	243	68	146	315
Brentwood Blvd.	Oak to Second	75	67.3	68.7	1.4	50	107	232	62	133	286
Brentwood Blvd.	Second to Chestnut	75	67.7	69.3	1.6	53	113	244	68	146	314
Brentwood Blvd.	Chestnut to Balfour	75	67.3	68.6	1.3	50	107	230	61	131	283
Brentwood Blvd.	South of Balfour	75	68.2	69.2	1	56	122	262	66	143	308
Delta Road	West of Brentwood	100	--	--	--	--	--	--	--	--	--
Delta Road	East of Brentwood	100	57.0	61.4	4.4	14	29	63	27	57	124
Delta Road	West of Sellers	100	56.7	57.8	1.1	13	28	61	15	33	71
Delta Road	East of Sellers	100	55.8	57.7	1.9	11	24	53	15	32	70
Sellers Ave.	North of Delta	100	57.9	57.9	0	16	33	72	16	33	72
Sellers Ave.	South of Delta	100	58.8	59.3	0.5	18	39	83	19	41	89
Lone Tree Way	West of Brentwood	100	60.3	64.3	4.0	22	48	104	41	89	193

Table 4.4-11
Predicted Baseline and Baseline + Project Traffic Noise Levels

			Traffic Noise Levels (Ldn dBA)			Distance to contours (feet) Baseline			Distance to Contours (feet) Baseline + Project		
Roadway	Segment	Distance	Baseline	Baseline + Project	Change	70 Ldn	65 Ldn	60 Ldn	70 Ldn	65 Ldn	60 Ldn
Lone Tree Way	East of Brentwood	100	52.2	59.9	**7.7**	6	14	30	21	45	98
Sunrise Drive	West of Brentwood	100	49.3	51.5	2.2	4	9	19	6	13	27
Gregory Lane	West of Brentwood	100	50.7	52.4	1.7	5	11	24	7	15	31
Hanson Lane	East of Brentwood	100	50.7	52.8	2.1	5	11	24	7	15	33
Homecoming Way	East of Brentwood	100	44.0	48.2	4.2	2	4	9	4	8	16
Grant/Sunset	West of Brentwood	100	55.7	59.0	3.3	11	24	52	18	40	86
Grant/Sunset	East of Brentwood	100	60.8	61.3	0.5	24	53	113	26	57	122
Havenwood Ave.	West of Brentwood	100	37.8	46.7	**8.9**	1	2	3	3	6	13
Havenwood Ave.	East of Brentwood	100	54.4	55.5	1.1	9	20	42	11	23	50
Applewood Common	West of Brentwood	100	43.2	52.3	**9.1**	2	4	8	7	14	31
Applewood Common	East of Brentwood	100	49.5	51.9	2.4	4	9	20	6	13	29
Sand Creek Road	West of Brentwood	100	61.2	64.8	3.6	26	56	120	45	96	208
Sand Creek Road	East of Brentwood	100	--	59.1	--	--	--	--	19	41	88
Technology Way	West of Brentwood	100	50.4	53.4	3.0	5	11	23	8	17	36
Nancy Street	West of Brentwood	100	--	52.5	--	--	--	--	7	15	31
Nancy Street	East of Brentwood	100	52.0	53.5	1.5	6	14	29	8	17	37
Village Drive	East of Brentwood	100	47.8	51.0	3.2	3	7	15	5	12	25
Central/Sycamore	West of Brentwood	100	60.0	61.1	1.1	22	47	100	26	55	119
Central/Sycamore	East of Brentwood	100	59.1	60.5	1.4	19	41	88	23	50	108
Second Street	South of Central	100	61.0	61.2	0.2	25	54	117	26	56	121
Central Blvd.	West of Second	100	60.8	61.9	1.1	24	53	114	29	62	134
Central Blvd.	East of Second	100	60.9	61.8	0.9	25	53	115	29	62	133
Central Blvd.	West of Walnut	100	61.4	62.3	0.9	27	58	124	31	67	143
Central Blvd.	East of Walnut	100	62.7	63.5	0.8	33	70	152	37	79	170
Walnut Blvd.	South of Central	100	58.5	58.6	0.1	17	37	80	17	37	81
Pine Street	East of Brentwood	100	47.8	47.8	0	3	7	15	3	7	15
Maple Street	West of Brentwood	100	--	--	--	--	--	--	--	--	--
Maple Street	East of Brentwood	100	48.9	48.9	0	4	8	18	4	8	18
Oak Street	West of Brentwood	100	59.4	60.2	0.8	20	42	91	22	48	104
Oak Street	East of Brentwood	100	57.1	57.1	0	14	30	64	14	30	64
Second Street	West of Brentwood	100	60.8	61.0	0.2	24	52	113	25	55	117

Table 4.4-11
Predicted Baseline and Baseline + Project Traffic Noise Levels

			Traffic Noise Levels (Ldn dBA)			Distance to contours (feet) Baseline			Distance to Contours (feet) Baseline + Project		
Roadway	Segment	Distance	Baseline	Baseline + Project	Change	70 Ldn	65 Ldn	60 Ldn	70 Ldn	65 Ldn	60 Ldn
Second Street	East of Brentwood	100	58.8	58.8	0	18	39	83	18	39	83
Chestnut Street	East of Brentwood	100	50.1	50.1	0	5	10	22	5	10	22
Balfour Road	West of Brentwood	100	65.6	65.6	0	51	110	237	51	110	237
Balfour Road	East of Brentwood	100	63.1	63.3	0.2	34	74	160	36	77	166
Sellers Ave.	North of Sunset	100	59.2	59.6	0.4	19	41	89	20	44	95
Sellers Ave.	South of Sunset	100	56.0	56.3	0.3	12	25	54	12	26	57
Sunset Road	West of Sellers	100	56.9	57.7	0.8	13	29	62	15	33	70
Sunset Road	East of Sellers	100	55.6	55.6	0	11	24	51	11	24	51

Bold Underline indicates an increase in noise levels exceeding 3 dB.

The Table 4.4-11 data indicate that the proposed project would result in traffic noise level increases ranging from +0.1 dB to +9.1 dB under baseline + project conditions, when compared to baseline no-project conditions.

A specific discussion of traffic impacts and mitigation measures is provided later in this study.

Table 4.4-12
Predicted Cumulative and Cumulative + Project Traffic Noise Levels

			Traffic Noise Levels (Ldn dBA)			Distance to contours (feet) Cumulative			Distance to Contours (feet) Cumulative + Project		
Roadway	Segment	Distance	Cumulative	Cumulative + Project	Change	70 Ldn	65 Ldn	60 Ldn	70 Ldn	65 Ldn	60 Ldn
Brentwood Blvd.	North of Delta	100	66.0	65.9	-0.1	54	117	253	53	114	246
Brentwood Blvd.	Delta to Sims	100	66.4	66.3	-0.1	58	125	269	57	122	263
Brentwood Blvd.	Sims to Lone Tree	100	66.9	66.8	-0.1	62	133	286	61	132	285
Brentwood Blvd.	Lone Tree to Sunrise	100	69.0	68.8	-0.2	86	185	400	83	178	384
Brentwood Blvd.	Sunrise to Gregory	100	69.3	69.0	-0.3	90	194	418	86	186	400
Brentwood Blvd.	Gregory to Hanson	100	69.3	69.0	-0.3	89	193	415	85	184	396
Brentwood Blvd.	Hanson to Homecoming	100	69.4	69.1	-0.3	91	196	423	88	189	406
Brentwood Blvd.	Homecoming to Grant	100	69.5	69.1	-0.4	92	199	429	87	188	405
Brentwood Blvd.	Grant to Sunset	100	69.0	68.7	-0.3	86	184	397	81	175	377
Brentwood Blvd.	Sunset to Havenwood	100	68.7	68.3	-0.4	82	178	383	77	167	359
Brentwood Blvd.	Havenwood to Applewood	75	71.0	70.5	-0.5	87	188	405	81	174	376
Brentwood Blvd.	Applewood to Sand Creek	75	71.1	70.6	-0.5	88	190	409	82	176	379
Brentwood Blvd.	Sand Creek to Technology	75	71.1	70.7	-0.4	88	190	410	83	179	386
Brentwood Blvd.	Technology to Nancy	75	71.0	70.6	-0.4	87	188	405	83	178	384
Brentwood Blvd.	Nancy to Village	75	70.7	70.5	-0.2	83	180	387	80	173	373
Brentwood Blvd.	Village to Central / Sycamore	75	70.5	70.3	-0.2	81	175	378	78	168	362
Brentwood Blvd.	Central / Sycamore to Spruce	75	68.9	68.6	-0.3	63	136	292	60	130	280
Brentwood Blvd.	Pine to Maple	75	63.2	63.0	-0.2	26	57	123	26	55	119
Brentwood Blvd.	Maple to Oak	75	63.9	63.6	-0.3	29	63	136	28	61	131
Brentwood Blvd.	Oak to Second	75	62.6	62.4	-0.2	24	52	111	23	50	108
Brentwood Blvd.	Second to Chestnut	75	63.8	63.6	-0.2	29	62	135	28	60	129
Brentwood Blvd.	Chestnut to Balfour	75	63.3	63.0	-0.3	27	58	124	26	55	119
Brentwood Blvd.	South of Balfour	75	65.0	65.0	0	35	76	163	35	75	162
Delta Road	West of Brentwood	100	55.4	55.3	-0.1	11	23	49	11	23	49
Delta Road	East of Brentwood	100	61.4	61.1	-0.3	27	58	125	26	55	118
Delta Road	West of Sellers	100	60.6	60.5	-0.1	24	51	110	23	50	108
Delta Road	East of Sellers	100	59.3	59.0	-0.3	19	42	90	18	40	85

Table 4.4-12
Predicted Cumulative and Cumulative + Project Traffic Noise Levels

			Traffic Noise Levels (Ldn dBA)			Distance to contours (feet) Cumulative			Distance to Contours (feet) Cumulative + Project		
Roadway	Segment	Distance	Cumulative	Cumulative + Project	Change	70 Ldn	65 Ldn	60 Ldn	70 Ldn	65 Ldn	60 Ldn
Sellers Ave.	North of Delta	100	58.8	58.1	-0.7	18	38	83	16	35	74
Sellers Ave.	South of Delta	100	60.2	59.7	-0.5	22	48	103	21	45	96
Lone Tree Way	West of Brentwood	100	65.7	65.5	-0.2	51	111	239	50	108	232
Lone Tree Way	East of Brentwood	100	56.1	55.8	-0.3	12	25	55	11	24	53
Sunrise Drive	West of Brentwood	100	52.3	50.2	-2.1	7	14	31	5	10	22
Gregory Lane	West of Brentwood	100	52.8	51.1	-1.7	7	15	33	5	12	25
Hanson Lane	East of Brentwood	100	54.7	51.7	-3	10	21	44	6	13	28
Homecoming Way	East of Brentwood	100	44.9	43.2	-1.7	2	5	10	2	4	8
Grant/Sunset	West of Brentwood	100	55.7	55.2	-0.5	11	24	52	10	22	47
Grant/Sunset	East of Brentwood	100	60.5	59.7	-0.8	23	50	107	21	44	95
Havenwood Ave.	West of Brentwood	100	42.1	41.8	-0.3	1	3	6	1	3	6
Havenwood Ave.	East of Brentwood	100	49.5	48.8	-0.7	4	9	20	4	8	18
Applewood Common	West of Brentwood	100	45.6	45.0	-0.6	2	5	11	2	5	10
Applewood Common	East of Brentwood	100	50.6	50.0	-0.6	5	11	24	5	10	21
Sand Creek Road	West of Brentwood	100	61.7	61.3	-0.4	28	60	130	26	57	122
Sand Creek Road	East of Brentwood	100	59.6	59.5	-0.1	20	44	94	20	43	93
Technology Way	West of Brentwood	100	51.2	50.8	-0.4	6	12	26	5	11	25
Nancy Street	West of Brentwood	100	--	52.5	--	--	--	--	7	15	31
Nancy Street	East of Brentwood	100	54.1	54.1	0	9	19	41	9	19	40
Village Drive	East of Brentwood	100	50.6	50.5	-0.1	5	11	24	5	11	23
Central/Sycamore	West of Brentwood	100	60.8	60.4	-0.4	24	52	112	23	49	106
Central/Sycamore	East of Brentwood	100	58.9	58.2	-0.7	18	39	85	16	35	76
Second Street	South of Central	100	62.1	61.9	-0.2	30	64	137	29	62	134
Central Blvd.	West of Second	100	63.8	63.5	-0.3	39	83	179	37	80	172
Central Blvd.	East of Second	100	64.2	63.9	-0.3	41	88	190	39	85	182
Central Blvd.	West of Walnut	100	63.7	63.5	-0.2	38	82	177	37	80	172
Central Blvd.	East of Walnut	100	64.9	64.8	-0.1	46	99	213	45	96	208
Walnut Blvd.	South of Central	100	62.6	62.4	-0.2	32	69	148	31	67	145
Pine Street	East of Brentwood	100	44.0	43.9	-0.1	2	4	9	2	4	8
Maple Street	West of Brentwood	100	53.4	53.3	-0.1	8	17	36	8	16	36
Maple Street	East of Brentwood	100	50.8	50.6	-0.2	5	11	24	5	11	23
Oak Street	West of Brentwood	100	56.4	56.3	-0.1	12	27	57	12	26	56

Table 4.4-12
Predicted Cumulative and Cumulative + Project Traffic Noise Levels

			Traffic Noise Levels (Ldn dBA)			Distance to contours (feet) Cumulative			Distance to Contours (feet) Cumulative + Project		
Roadway	Segment	Distance	Cumulative	Cumulative + Project	Change	70 Ldn	65 Ldn	60 Ldn	70 Ldn	65 Ldn	60 Ldn
Oak Street	East of Brentwood	100	55.1	55.0	-0.1	10	22	47	10	22	47
Second Street	West of Brentwood	100	59.9	60.7	0.8	21	46	99	24	52	112
Second Street	East of Brentwood	100	58.4	59.5	1.1	17	36	78	20	43	93
Chestnut Street	East of Brentwood	100	47.0	46.6	-0.4	3	6	14	3	6	13
Balfour Road	West of Brentwood	100	63.5	63.6	0.1	37	80	172	37	80	173
Balfour Road	East of Brentwood	100	61.2	61.1	-0.1	26	55	119	26	55	119
Sellers Ave.	North of Sunset	100	60.8	60.5	-0.3	24	52	112	23	50	108
Sellers Ave.	South of Sunset	100	57.8	57.6	-0.2	15	33	72	15	32	69
Sunset Road	West of Sellers	100	59.0	58.8	-0.2	18	40	85	18	38	83
Sunset Road	East of Sellers	100	56.9	56.8	-0.1	13	29	62	13	28	61

Bold Underline indicates an increase in noise levels exceeding 3 dB.

The Table 4.4-12 data indicate that the proposed project would result in traffic noise level increases ranging from +0.1 dB to +1.1 dB under cumulative + project conditions, when compared to cumulative no-project conditions. As stated earlier, the bypass is expected to result in a decrease in traffic volumes of approximately 20% along Brentwood Boulevard. This will result in a reduction in traffic noise of approximately 1 dB Ldn.

A specific discussion of traffic impacts and mitigation measures is provided later in this study.

Traffic Vibration Impact Assessment Methodology

As a means of evaluating potential traffic vibration levels, j.c. brennan & associates, Inc., compared the field vibration measurements to the vibration criteria previously cited in this section. Based upon the measurement data, vibration measurements of 0.115 in/sec p.p.v. and 0.110 in/sec p.p.v at 50 feet were recorded. The 50 foot measurement distance corresponds to the approximate location of the current Brentwood Boulevard right-of-way, however, increased setbacks are proposed for residences adjacent to the right-of-way. The project area is predicted to be exposed to vibration levels less than the threshold for structural damage or human annoyance.

Railroad Noise Assessment Methodology

As stated earlier, the adjacent UPRR line does not appear to be in use. This railroad line has not been in use since prior to the year 2000. Further research indicates that the Mountain House Community Master Plan EIR, which is to the southeast along the same UPRR line, indicates that the line is a standby route with no contemplated use for freight movement. However, there are indications that future use of the line could be used for commuter passenger service or future freight service. At this time there remains no indication of the future operations along this route.

Rail operations associated with light rail passenger service is generally quiet in comparison to freight train operations. Although light rail operations may include 50 or more operations per day, the 60 dB CNEL contour will generally not extend more than 100 feet from the railroad track centerline.

To conservatively estimate potential noise impacts associated with railroad line activities, it was assumed that up to 10 freight train operations may occur during a 24-hour period. Assuming that each train generated a sound exposure level (SEL) of 100 dB at a distance of 100 feet from the railroad centerline, the Ldn noise level can be calculated using the following equation.

$$Ldn = SEL + 10 \log N_{eq} - 49.4 \text{ dB, where:}$$

SEL is the typical single event sound exposure level of an individual train event (100 dB at a distance of 100 feet), N_{eq} is the sum of the daytime (7 a.m. to 10 p.m.) train events, plus 10 times the number of nighttime (10 p.m. to 7 a.m.) train events (a total of 44), and 49.4 is ten times the logarithm of the number of seconds per day. Assuming an even distribution of trains between daytime, evening and nighttime hours, the Ldn would be 67 dB at 100 feet. The locations of the potential noise contours are shown in Table 4.4-13.

Table 4.4-13

Potential UPRR Railroad Line Noise Levels
(Based Upon an Estimate of 10 Freight Trains / Day)

Predicted Noise Levels					
			Distances to Noise Contours (feet)		
@ 50 feet	@ 100 feet	@ 200 feet	60 dB Ldn	65 dB Ldn	70 dB Ldn
71.5 dB Ldn	67 dB Ldn	62.5 dB Ldn	290	135	62
All distances to noise levels are from the railroad track centerline.					

Railroad Vibration Assessment Methodology

Because the adjacent railroad tracks are not in daily operation, it was not feasible to obtain vibration measurements of train passbys. However, j.c. brennan & associates, Inc. has conducted vibration measurements at a distance of 50 feet from the UPRR railroad tracks in the Lathrop and Madera areas. The results of these measurements are provided in Table 4.4-14.

Table 4.4-14
Summary of Vibration Measurements

Location	Description	Vmp (in/sec PPV)	Threshold of Annoyance (in/sec PPV)
Recent Railroad Measurements (50 Feet From Tracks)	Freight Train	0.0504	0.1
	Freight Train	0.0611	
Source: j.c. brennan & associates, Inc., 2006-2007			

Based upon the Table 4.4-7 data, it is not expected that vibration levels from any potential future railroad operations would exceed any applicable standards.

Future Noise-Producing Land Use Impact Assessment Methodology

There are a variety of noise sources associated with future development within the project area which have the potential to create noise levels in excess of the applicable noise standards or result in annoyance at existing and future noise-sensitive developments within the project area. Such uses include commercial retail, industrial uses and parks,.

At this time specific uses are not known and detailed site and grading plans have not yet been developed. As a result, it is not feasible to identify specific noise impacts associated with each of the proposed uses. However, a general discussion and assessment of impacts can be conducted based upon the possible types of uses associated with these land use designations. The following is a discussion of the potentially significant noise sources associated with the various types of proposed uses:

Commercial Retail Land Uses

Commercial retail land use activities can produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which may be annoying to individuals who live in the nearby vicinity. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day and existing ambient noise levels. The primary noise sources generally include truck deliveries, on-site truck circulation, trash pickup, parking lot use, HVAC equipment and loading docks. Examples of the equipment with a tonal component would include HVAC equipment back-up alarms on forklifts or trucks.

Mechanical Equipment

Heating, air conditioning and ventilation (HVAC) equipment can be a primary noise source associated with commercial or retail uses. These types of equipment are often mounted on roof tops, located on the ground or located within mechanical rooms. The noise sources can take the form of fans, pumps, air compressors, chillers or cooling towers.

Noise levels from these types of equipment can vary significantly. Noise levels from these types of sources generally range between 45 dB to 70 dB at a distance of 50 feet. However, numerous noise control strategies can be utilized to mitigate noise levels to less than significant levels. These can take the form of barriers, parapets, lined duct work on HVAC equipment or acoustical louvers.

On-Site Truck Traffic and Parking Lot Noise

On-site truck circulation, truck deliveries, and parking lot noise generally associated with commercial retail land uses have the potential to impact nearby noise-sensitive land uses. Typical maximum noise levels associated with on-site truck circulation and deliveries range from 63 dB to 85 dB at 50 feet. Noise associated with parking lot activities generally include automobile arrivals and departures, car doors slamming, car stereos, and conversations. The extent of the impact depends on the specific site design and construction details of the commercial retail parcel and the proximity to adjacent noise-sensitive uses.

Industrial Land Uses:

Noise associated with industrial land uses can include numerous types of activities and sources. In addition, noise sources associated with industrial land uses can occur 24-hours per day, and vary based upon temperature and other atmospheric conditions, elevations of the noise sources, tonal components of the noise sources, on-site shielding of the noise sources and directionality of the sources. Noise sources can include, but are not limited to the following:

HVAC and ventilation systems, loading docks, steam valves, cooling towers, industrial scrubbers, generators, conveyor systems, and heavy on-site equipment. It is not possible to assess the impacts associated with these types of noise sources, due to the fact that site plans and project specific operations have not been submitted. However, the General Plan Noise Element provides guidance for assessing new projects which may include these types of noise sources or

on-site operations. Therefore, each project proposed within the Specific Plan will need to follow the requirements for completion of the noise assessment, as well comply with the noise level criteria contained within the General Plan Noise Element.

Parks:

The project area includes several small park sites. Children playing at neighborhood parks are often considered potentially significant noise sources which could adversely affect adjacent noise-sensitive land uses. Typical noise levels associated with groups of approximately 50 children playing at a distance of 50 feet generally range from 55 to 60 dB Leq, with maximum noise levels ranging from 70 to 75 dB. It is expected that the playground areas would be utilized during daytime hours. Therefore, noise levels from the playgrounds would need to comply with the Brentwood 50 dB Leq and 70 dB Lmax exterior noise level standards at the nearest residential uses. Based upon the reference noise level data discussed above, the 50 dB Leq noise contour would be located approximately 100 feet from the center of park sites. The 75 dB Lmax contour would be located at approximately 50 feet from the perimeter of the playgrounds.

Given the proximity of most parks to residential uses, the potential for exceedance of the noise standards exists, depending on the orientation and proximity of the play areas to those nearest residences, the number of children using the play areas at a given time, and the types of activities the children are engaged in.

Construction Noise Impact Assessment Methodology

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. Activities involved in construction would generate maximum noise levels, as indicated in Table 4.4-15, ranging from 85 to 90 dB at a distance of 50 feet. Construction activities would be temporary in nature and are anticipated to occur during normal daytime working hours.

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

Table 4.4-15 Construction Equipment Noise	
Type of Equipment	Maximum Level, dB at 50 feet
Bulldozers	87
Heavy Trucks	88
Backhoe	85
Pneumatic Tools	85
Source: Environmental Noise Pollution, Patrick R. Cunniff, 1977.	

Overview of Noise Mitigation Options

The following overview is provided since the noise evaluation area is in the specific plan stage, and shall be used during finalization of the project site plans within the Specific Plan area.

Any noise problem may be considered as being composed of three basic elements: the noise source, a transmission path, and a receiver. The appropriate acoustical treatment for a given project should consider the nature of the noise source and the sensitivity of the receiver. The problem should be defined in terms of appropriate criteria (Ldn, Leq, or Lmax), the location of the sensitive receiver (inside or outside), and when the problem occurs (daytime or nighttime). Noise control techniques should then be selected to provide an acceptable noise environment for the receiving property while remaining consistent with local aesthetic standards and practical structural and economic limits. Fundamental noise control options include the following:

Use of Setbacks:

Noise exposure may be reduced by increasing the distance between the noise source and receiving use. Setback areas can take the form of open space, frontage roads, recreational areas, storage yards, etc. The available noise attenuation from this technique is limited by the characteristics of the noise source, but is generally about 4 to 6 dB per doubling of distance from the source.

Use of Barriers:

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

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

barrier height than does a location closer to either source or receiver.

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

There are practical limits to the noise reduction provided by barriers. For vehicle traffic or railroad noise, a 5 to 10 dB noise reduction may often be reasonably attained. A 15 dB noise reduction is sometimes possible, but a 20 dB noise reduction is extremely difficult to achieve. Barriers usually are provided in the form of walls, berms, or berm/wall combinations. The use of an earth berm in lieu of a solid wall may provide up to 3 dB additional attenuation over that attained by a solid wall alone, due to the absorption provided by the earth. Berm/wall combinations offer slightly better acoustical performance than solid walls, and are often preferred for aesthetic reasons.

Site Design:

Buildings can be placed on a project site to shield other structures or areas, to remove them from noise-impacted areas, and to prevent an increase in noise level caused by reflections. The use of one building to shield another can significantly reduce overall project noise control costs, particularly if the shielding structure is insensitive to noise.

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

Noise Reduction by Building Facades:

When interior noise levels are of concern in a noisy environment, noise reduction may be obtained through acoustical design of building facades. Standard construction practices provide 10-15 dB noise reduction for building facades with open windows, and approximately 25 dB noise reduction when windows are closed. Thus a 25 dB exterior-to-interior noise reduction can be obtained by the requirement that building design include adequate ventilation systems, allowing windows on a noise-impacted facade to remain closed under any weather condition.

Where greater noise reduction is required, acoustical treatment of the building facade is necessary. Reduction of relative window area is the most effective control technique, followed

by providing acoustical glazing (thicker glass or increased air space between panes) in low air infiltration rate frames, use of fixed (non-movable) acoustical glazing or the elimination of windows. Noise transmitted through walls can be reduced by increasing wall mass (using stucco or brick in lieu of wood siding), isolating wall members by the use of double or staggered stud walls, or mounting interior walls on resilient channels. Noise control for exterior doorways is provided by reducing door area, using solid-core doors, and by acoustically sealing door perimeters with suitable gaskets. Roof treatments may include the use of plywood sheathing under roofing materials.

An additional measure to prevent sound from entering through attic vents would be to acoustically baffle all attic vents. The baffles should introduce at least one 90 degree obstruction to the flow of air through the vent. The baffle should be lined with an acoustically absorbent material such as, one-inch thick, fiberglass duct liner, with an NRC (Noise Reduction Coefficient) of 0.8.

Use of Vegetation:

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

Vegetation can be used to acoustically "soften" intervening ground between a noise source and receiver, increasing ground absorption of sound and thus increasing the attenuation of sound with distance. Planting of trees and shrubs is also of aesthetic and psychological value, and may reduce adverse public reaction to a noise source by removing the source from view, even though noise levels will be largely unaffected. It should be noted, however, that trees planted on the top of a noise control berm can actually slightly degrade the acoustical performance of the barrier. This effect can occur when high frequency sounds are diffracted (bent) by foliage and directed downward over a barrier.

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

SPECIFIC IMPACTS AND MITIGATION MEASURES

Impact 4.4-1: Impact of Traffic Noise Level Increases at Existing Land Uses in the Project Area. Existing residences located along major roadways in the vicinity of the project area will be exposed to elevated traffic noise levels under baseline and cumulative buildout conditions either with or without the project. Table 4.4-11 indicates that traffic noise level increases resulting from the proposed project would range from +0.1 dB to +9.1 dB Ldn, for baseline conditions relative to no-project conditions. Table 4.4-12 indicates that the cumulative traffic noise level increases resulting from the proposed project development would range from +0.1 dB to +1.1 dB Ldn, relative to no-project noise levels.

Based upon field observations, the significant increases in traffic noise levels occur along the following roadway segments:

- Lone Tree Way, east of Brentwood Boulevard;
- Havenwood Avenue, west of Brentwood Boulevard;
- Applewood Common, west of Brentwood Boulevard.

Based upon field observations, in each case all noise-sensitive uses and commercial uses along these roadway segments are located outside of the 60 dB Ldn noise level contour, and would comply with the City's exterior noise level standard of 60 dB Ldn. **Therefore, this impact is considered less than significant**.

Mitigation for Impact 4.4-1:

None Required

Impact 4.4-2: Impact of Traffic Noise at Future Noise-Sensitive Land Uses Developed Within the Project Area. Proposed land uses located adjacent to any of the major project-area arterial roadways may be impacted by traffic noise. The degree by which traffic noise levels will exceed the City of Brentwood exterior noise level standard will depend on the proximity of the proposed noise-sensitive uses to the major roadways within the project vicinity, and the individual noise generation of those roadways. It is likely that uses will be developed within areas exposed to projected future traffic noise levels in excess of the applicable noise standards. **Therefore, this impact is considered potentially significant in need of mitigation.**

The City of Brentwood General Plan Noise Element establishes 60 dB CNEL/Ldn as the acceptable exterior noise standard for most noise sensitive uses exposed to transportation noise sources. The standard applies to residential uses, transient lodging, hospitals, churches/meeting halls, office buildings, and schools. A standard of 70 dB Ldn is applied to playgrounds and neighborhood parks. The standard is applied at "Outdoor Activity Areas." Typically, this would include the primary areas where people spend time outdoors for recreation or relaxation. In the

case of a single family residential development, the exterior noise level standard is applied at the backyard or patio areas of each residence. For multi-family residential uses the standard may be applied at individual patios, a property line, or at a common area which is designated for recreation or outdoor activities such as a recreation complex, swimming pool, or park.

In order to assess the potential for noise impacts at future development along the Brentwood Blvd. corridor, j.c. brennan & associates, Inc. calculated exterior noise levels at a distance of approximately 25-30 feet outside of the Brentwood Blvd. Right-of-Way. The intent of this process was to approximate exterior noise levels at typical setback distances, accounting for the 15' foot minimum setback requirement specified in the City of Brentwood Residential Design Guidelines. Tables 4.4-16 and 4.4-17 show the predicted exterior noise levels for the Brentwood Blvd. corridor, assuming typical setbacks. The tables also show the affect of locating outdoor activity areas behind the structure of one, or more rows of buildings. These shielding effects are discussed in the Caltrans Technical Noise Supplement (Section N-2144, Caltrans 1998 Technical Noise Supplement, TeNS):

> *Depending on the site geometry, the first row of houses or buildings next to a highway may shield the second and successive rows. This is often the case where the facility is at-grade or depressed. The amount of noise reduction varies with house or building sizes, spacing of houses or buildings, and site geometry. Generally, for an at-grade facility in an average residential area where the first row houses cover at least 40% of total area (i.e. no more than 60% spacing), the reduction provided by the first row is reasonably assumed at 3 dBA, and 1.5 dBA for each additional row. For example, behind the fist row we may expect a 3 dBA noise reduction, behind the second row 4.5 dBA, third row 6 dBA, etc. For houses or buildings "packed" tightly, (covering about 65-90% of the area, with 10-35% open space), the first row provides about 5 dBA reduction. Successive rows still reduce 1.5 dBA per row.*

Tables 4.4-16 and 4.4-17 show the shielding affects that could be expected from shielding outdoor activity, as discussed above. A building coverage of 65-90% was assumed for the calculations.

Tables 4.4-16 and 4.4-17 show the shielding affects that could be expected from shielding outdoor activity, as discussed above. A building coverage of 65-90% was assumed for the calculations.

Table 4.4-16
Predicted Exterior Noise Levels – Brentwood Blvd. Corridor
Baseline + Project

Roadway Segment	Exterior Noise Level at 1st Row Façades - 1st Floor, dB Ldn	Traffic Noise Levels with Varying Locations of Outdoor Activity Areas, dB Ldn: Behind 1st Row of Buildings	Behind 2nd Row of Buildings	Behind 3rd Row of Buildings
Brentwood Blvd				
Delta to Sims	70	62	58	56
Sims to Lone Tree	70	62	59	56
Lone Tree to Sunrise	71	63	60	57
Sunrise to Gregory	71	64	60	57
Gregory to Hanson	71	64	60	57
Hanson to Homecoming	71	64	60	57
Homecoming to Grant	71	64	60	57
Grant to Sunset	71	64	60	57
Sunset to Havenwood	71	64	60	57
Havenwood to Applewood	73	66	62	59
Applewood to Sand Creek	74	66	62	60
Sand Creek to Technology	72	64	61	58
Technology to Nancy	72	64	61	58
Nancy to Village	72	64	61	58
Village to Central / Sycamore	72	64	61	58
Central / Sycamore to Spruce	71	63	60	57

Source: j.c. brennan & associates, Inc. 2007.

Table 4.4-17
Predicted Exterior Noise Levels – Brentwood Blvd. Corridor
Cumulative + Project

Roadway Segment	Exterior Noise Level at 1st Row Façades - 1st Floor, dB Ldn	Traffic Noise Levels with Varying Locations of Outdoor Activity Areas, dB Ldn		
		Behind 1st Row of Buildings	Behind 2nd Row of Buildings	Behind 3rd Row of Buildings
Brentwood Blvd				
Delta to Sims	66	59	55	52
Sims to Lone Tree	67	59	56	53
Lone Tree to Sunrise	69	61	58	55
Sunrise to Gregory	69	61	58	55
Gregory to Hanson	69	61	58	55
Hanson to Homecoming	69	61	58	55
Homecoming to Grant	69	61	58	55
Grant to Sunset	69	61	58	55
Sunset to Havenwood	68	61	57	54
Havenwood to Applewood	71	63	59	57
Applewood to Sand Creek	71	63	60	57
Sand Creek to Technology	71	63	60	57
Technology to Nancy	71	63	60	57
Nancy to Village	71	63	59	57
Village to Central / Sycamore	70	63	59	56
Central / Sycamore to Spruce	69	61	58	55

Source: j.c. brennan & associates, Inc. 2007.

The Table 4.4-16 data indicate that locating outdoor activity areas behind the 2nd-3rd row of homes is predicted to results in compliance with the City of Brentwood 60 dB Ldn exterior noise level standard under the baseline + project scenario.

The Table 4.4-17 data indicate that locating outdoor activity areas behind the 1st-2nd row of homes is predicted to results in compliance with the City of Brentwood 60 dB Ldn exterior noise level standard under the cumulative + project scenario.

Exterior noise levels could also be mitigated through the use of increased setbacks from Brentwood Blvd. A single row of buildings typically provides a 5 dB reduction in traffic noise levels, at outdoor activity areas shielded by the intervening row of buildings. Therefore, locating proposed noise sensitive uses outside of the 65 dB Ldn noise contour, and placing outdoor activity areas at the rear of the structure is predicted to result in compliance with the City's 60 dB Ldn exterior noise standard.

Mitigation for Impact 4.4-2:

MM 4.4-2a: Outdoor activity areas of future noise sensitive uses should be located outside of the predicted baseline + project and/or cumulative + project 60 dB Ldn exterior noise level contours. This could be achieved through the site design measures described above and as shown in Tables 4.4-16 and 4.4-17. Where the City determines that the use of standard site design measures cannot be used to achieve compliance with the City's 60 dB Ldn exterior noise level standard, a site-specific noise analysis should be prepared.

Significance after Mitigation: Less than Significant.

Impact 4.4-3 The Proposed Project could expose new sensitive receptors to excessive interior noise levels. The City of Brentwood General Plan establishes an acceptable interior noise level standard of 45 dB L_{dn} for residential uses exposed to traffic noise. Because the proposed project could expose new dwelling units to interior traffic noise levels in excess of the City's interior noise level standards, this impact is considered ***potentially significant.***

Tables 4.4-18 and 4.4-19 show the predicted future interior traffic noise levels along the Brentwood Blvd. corridor. The Tables assume a standard exterior-to-interior noise level reduction of 25 dB with supplemental ventilation, typically provided by modern residential construction practices. Where interior noise levels are predicted to exceed 45 dB Ldn, estimated interior mitigation measures are also specified.

Table 4.4-18
Predicted Interior Noise Levels – Brentwood Blvd. Corridor
Baseline + Project

Roadway Segment	Exterior Noise Level at 1st Floor Façades, dB Ldn	Exterior Noise Level at 2nd Floor Façades, dB Ldn[1]	1st Floor Interior Noise Level[2]	2nd Floor Interior Noise Level[2]	Required STC Window Ratings[3]
Brentwood Blvd.					
Delta to Sims	70	73	45	48	33
Sims to Lone Tree	70	73	45	48	33
Lone Tree to Sunrise	71	74	46	49	34
Sunrise to Gregory	71	74	46	49	34
Gregory to Hanson	71	74	46	49	34
Hanson to Homecoming	71	74	46	49	34
Homecoming to Grant	71	74	46	49	34
Grant to Sunset	71	74	46	49	34
Sunset to Havenwood	71	74	46	49	34
Havenwood to Applewood	73	76	48	51	36
Applewood to Sand Creek	74	77	49	52	37
Sand Creek to Technology	72	75	47	50	35
Technology to Nancy	72	75	47	50	35
Nancy to Village	72	75	47	50	35
Village to Central / Sycamore	72	75	47	50	35
Central / Sycamore to Spruce	71	74	46	49	34

[1] 2nd and 3rd floor facades include a +3 dB offset to account for lost ground attenuation.
[2] Interior noise levels are estimated based upon a 25 dB exterior-to-interior noise level reduction typically provided by modern construction practices. Assumes windows closed and centrally distributed outside air ventilation provided for occupants.
[3] STC = Sound Transmission Class, Applies to all windows with a direct line of site to the roadway and includes glass doors.

Table 4.4-19
Predicted Interior Noise Levels – Brentwood Blvd. Corridor
Cumulative + Project

Roadway Segment	Exterior Noise Level at 1st Floor Façades, dB Ldn	Exterior Noise Level at 2nd Floor Façades, dB Ldn[1]	1st Floor Interior Noise Level[2]	2nd Floor Interior Noise Level[2]	Required STC Window Rating[3]
Brentwood Blvd.					
Delta to Sims	66	69	41	44	NA
Sims to Lone Tree	67	70	42	45	NA
Lone Tree to Sunrise	69	72	44	47	32
Sunrise to Gregory	69	72	44	47	32
Gregory to Hanson	69	72	44	47	32
Hanson to Homecoming	69	72	44	47	32
Homecoming to Grant	69	72	44	47	32
Grant to Sunset	69	72	44	47	32
Sunset to Havenwood	68	71	43	46	31
Havenwood to Applewood	71	74	46	49	34
Applewood to Sand Creek	71	74	46	49	34
Sand Creek to Technology	71	74	46	49	34
Technology to Nancy	71	74	46	49	34
Nancy to Village	71	74	46	49	34
Village to Central / Sycamore	70	73	45	48	33
Central / Sycamore to Spruce	69	72	44	47	32

[1] 2nd and 3rd floor facades include a +3 dB offset to account for lost ground attenuation.
[2] Interior noise levels are estimated based upon a 25 dB exterior-to-interior noise level reduction typically provided by modern construction practices. Assumes windows closed and air-conditioning provided for occupants.
[3] STC = Sound Transmission Class, Applies to all windows with a direct line of site to the roadway and includes glass doors.

The Table 4.4-18 data indicate that future residential uses adjacent to Brentwood Blvd. may be exposed to interior noise levels of 41-52 dB Ldn under the baseline + project scenario.

The Table 4.4-19 data indicate that future residential uses adjacent to Brentwood Blvd. may be exposed to interior noise levels of 41-49 dB Ldn under the cumulative + project scenario.

Mitigation for Impact 4.4-3:

Mitigation

The following mitigation measures would reduce the potential for interior noise level impacts to less than significant levels:

MM 4.4-3a: It is anticipated that residential uses constructed at the minimum setback along Brentwood Blvd. would be required to have glass windows and doors with the sound transmission class (STC) ratings as outlined in Tables 4.4-18 and 4.4-19 under the baseline + project and cumulative + project scenarios.

MM 4.4-3b Prior to the issuance of building permits, mechanical ventilation systems shall be included in the project design for the review and approval of the City Building Official. The use of mechanical ventilation systems would allow occupants to keep windows and doors closed to achieve acoustical isolation from traffic noise.

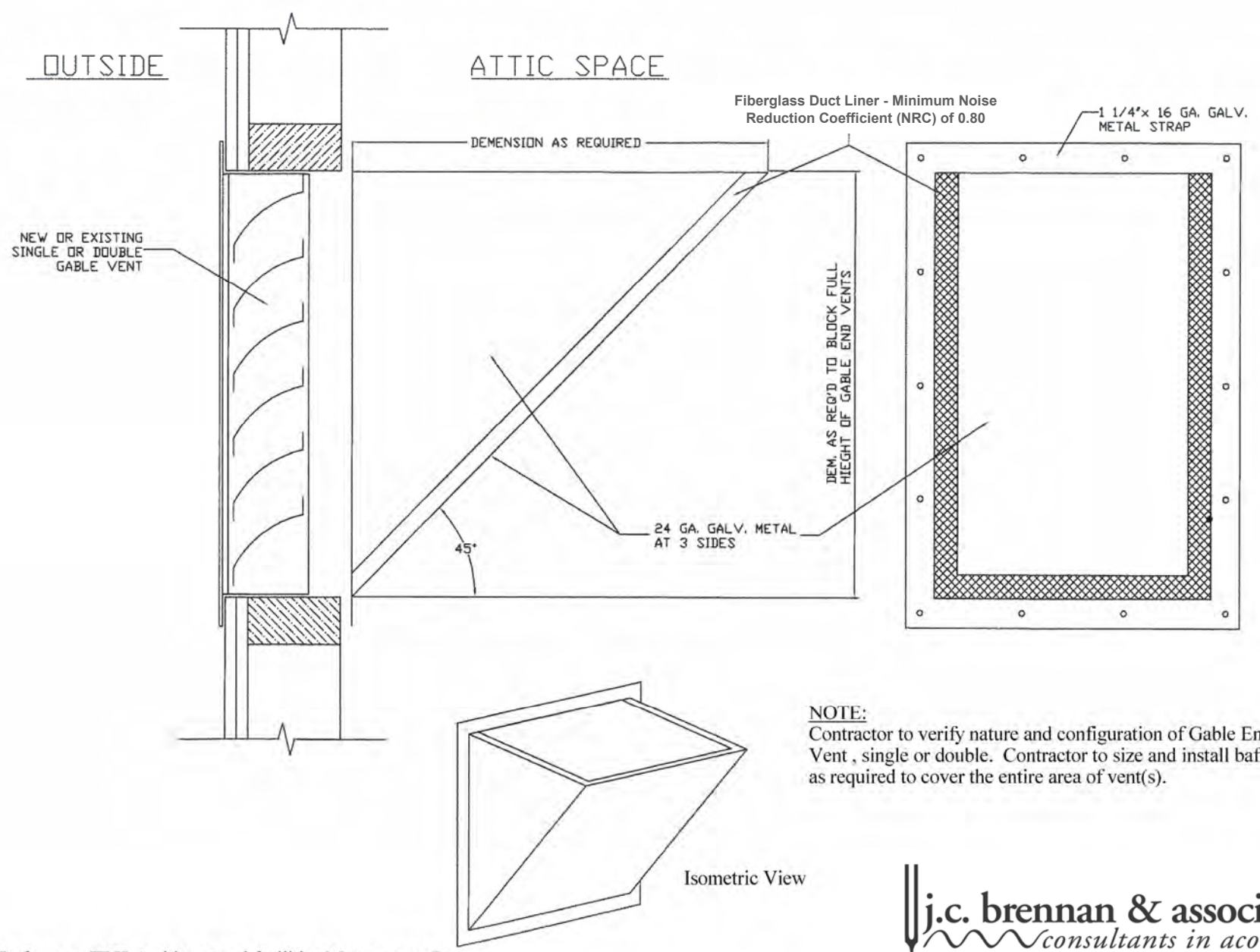
MM 4.4-3c All attic vents should be acoustically baffled in first row residential uses constructed along the Brentwood Blvd. corridor. The baffles should introduce at least one 90 degree obstruction to the flow of air through the vent. The baffle should be lined with an acoustically absorbent material. See Figure 4.4-7 for an example of an acoustical attic vent baffle.

Significance after Mitigation: Less than significant

Figure 4.4-7

Brentwood Blvd. Specific Plan – City of Brentwood, California

Recommended Attic Baffle



NOTE:
Contractor to verify nature and configuration of Gable End Vent , single or double. Contractor to size and install baffle as required to cover the entire area of vent(s).

Reference; TRK Architects and facilities Management Inc.

j.c. brennan & associates
consultants in acoustics

Impact 4.4-4: Impacts of Exterior and Interior Railroad Noise Levels on Proposed Office Uses in the Project Area. As stated in the methodology section of this report, noise impacts associated with future railroad operations were conservatively estimated. However, based upon the land use plan, the proposed office uses could be located adjacent to the UPRR tracks. **Therefore, this is considered to be a potentially significant impact in need of mitigation.**

Mitigation for Impact 4.4-4:

MM 4.4-4a: Where possible, office uses should be located a minimum of 100 feet from the railroad track centerline.

MM 4.4-4b: If office uses include outdoor activity areas for occupants to congregate, they should be located on the opposite sides of the building facades from the railroad track to receive adequate shielding from railroad noise levels.

MM 4.4-4c: If offices are located closer than 100 feet from the railroad track centerline, a detailed acoustical analysis, consistent with the Noise Element shall be conducted to determine the exterior and interior noise impacts.

MM 4.4-4d: The first line of office uses located between 100 feet and 200 feet from the railroad track centerline should include windows with a minimum STC rating of 35 on office facades with a view of the railroad track. The intent is to prevent maximum noise levels associated with railroad operations from interfering with speech within the offices.

Significance after Mitigation: Less than Significant.

Impact 4.4-5: Impacts of Commercial and Industrial Noise Sources on Existing and Future Noise-Sensitive Uses in the Project Area. As stated in the methodology section of this report, noise impacts associated with future uses developed within the commercial retail areas cannot practically be evaluated due to the wide range of variables which will affect such noise generation. Because the zoning of the mixed use areas would allow for certain uses which could generate significant noise levels, the potential for off-site adverse noise impacts exists, even though it cannot practically be quantified at this time. **Therefore, this impact is considered potentially significant in need of mitigation.**

Mitigation for Impact 4.4-5:

MM 4.4-5a: Proposed Commercial and Industrial Uses within the Specific Plan area shall be required to comply with the Noise Element standards. Where it is not practical to comply with the Noise Element standards.

MM 4.4-5b: During project review, the Planning Director shall make a determination as to whether or not the proposed commercial or industrial use would likely generate noise levels which could adversely affect the adjacent residential areas. If it is determined from this review that proposed uses could generate excessive noise levels at noise-sensitive uses, the applicant shall be required to prepare an acoustical analysis consistent with the Noise Element, to ensure that all appropriate noise control measures are incorporated into the project design and to mitigate any noise impacts. Such noise control measures include, but are not limited to, use of noise barriers, site-redesign, silencers, partial or complete enclosures of critical equipment, etc.

MM 4.4-5c: Where commercial or industrial uses adjoin residential property lines, and loading docks or large truck circulation routes face the residential areas, the following mitigation measures should be included in the project design:

- Loading docks should maintain a minimum distance of 100 feet from residential property lines;
- Property line barriers should be a minimum of 8-feet in height, in order to break line of sight to semi-tractor trailers and shield adjacent residential uses;
- Circulation routes for large trucks should be located a minimum of 50-feet from the residential property lines;
- Loading dock activities and shipping/receiving hours shall be limited to daytime hours (7am to 10pm)
- All large heating, cooling and ventilation equipment should be located within mechanical rooms or shielded on the ground, where it is possible;
- All roof-top exterior heating, cooling and ventilation equipment shall be shielded from view with solid noise barriers, or parapets;
- Emergency generators shall comply with the local noise criteria.

***MM 4.4-5d*:** Where commercial or industrial land uses are separated from residential areas by local streets, all loading activities should be constrained to the opposite sides of the buildings from residential uses.

Significance after Mitigation: Less than Significant.

Impact 4.4-6: Impact of Neighborhood Parks on Future Noise-Sensitive Uses Within the Project Area. Neighborhood park are generally considered to be attributes to the community. However, noise from active recreation parks could generate noise levels in excess of the City of Brentwood standards. Noise associated with park uses has been frequently cited as a potential source of annoyance at noise-sensitive areas. **Therefore, this impact is considered potentially significant.**

Mitigation for Impact 4.4-6:

MM 4.4-6a: Active recreation areas such as neighborhood parks should be located as far as possible from residential property lines. Where practical, parks should not be located adjacent to residential property lines, and should be separated from residential uses by local streets.

MM 4.4-6b: Neighborhood parks should be limited to the daytime hours.

Significance after Mitigation: Less than Significant.

Impact 4.4-7: Construction Noise. Activities associated with construction will result in elevated noise levels, with maximum noise levels ranging from 85-90 dB at 100 feet, as shown in Table 4.4-15. Construction activities would be temporary in nature and would likely occur during normal daytime working hours. Nonetheless, because construction activities would result in periods of elevated noise levels, **this impact is considered potentially significant in need of mitigation.**

Mitigation for Impact 4.4-7:

MM 4.4-7a: Construction activities should adhere to the requirements of the City of Brentwood General Plan Noise Element with respect to hours of operation.

MM 4.4-7b: All equipment shall be fitted with factory equipped mufflers, and in good working order.

MM 4.4-7c: Staging areas for equipment and water trucks shall be located as far as possible from residential areas.

Significance after Mitigation: Less than Significant.

Appendix 4.4-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.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of 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 into a one-second event.
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.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

Appendix 4.4-B

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Existing Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Brentwood Blvd.	North of Delta	21,329	83		17	2	3	40	100	
2	Brentwood Blvd.	Delta to Sims	21,900	83		17	2	3	40	100	
3	Brentwood Blvd.	Sims to Lone Tree	22,400	83		17	2	3	40	100	
4	Brentwood Blvd.	Lone Tree to Sunrise	18,081	83		17	2	3	40	100	
5	Brentwood Blvd.	Sunrise to Gregory	26,854	83		17	2	3	40	100	
6	Brentwood Blvd.	Gregory to Hanson	26,205	83		17	2	3	40	100	
7	Brentwood Blvd.	Hanson to Homecoming	24,661	83		17	2	3	40	100	
8	Brentwood Blvd.	Homecoming to Grant	25,426	83		17	2	3	40	100	
9	Brentwood Blvd.	Grant to Sunset	25,729	83		17	2	3	40	100	
10	Brentwood Blvd.	Sunset to Havenwood	27,215	83		17	2	3	40	100	
11	Brentwood Blvd.	Havenwood to Applewood	28,846	83		17	2	3	40	75	
12	Brentwood Blvd.	Applewood to Sand Creek	29,812	83		17	2	3	40	75	
13	Brentwood Blvd.	Sand Creek to Technology	21,068	83		17	2	3	40	75	
14	Brentwood Blvd.	Technology to Nancy	20,866	83		17	2	3	40	75	
15	Brentwood Blvd.	Nancy to Village	21,212	83		17	2	3	40	75	
16	Brentwood Blvd.	Village to Central / Sycamore	21,284	83		17	2	3	40	75	
17	Brentwood Blvd.	Central / Sycamore to Spruce	17,286	83		17	2	3	40	75	
18	Brentwood Blvd.	Pine to Maple	13,689	83		17	2	3	40	75	
19	Brentwood Blvd.	Maple to Oak	13,367	83		17	2	3	40	75	
20	Brentwood Blvd.	Oak to Second	11,800	83		17	2	3	40	75	
21	Brentwood Blvd.	Second to Chestnut	13,427	83		17	2	3	40	75	
22	Brentwood Blvd.	Chestnut to Balfour	11,455	83		17	2	3	40	75	
23	Brentwood Blvd.	Balfour to Sunset	18,416	83		17	2	3	40	75	

Appendix 4.4-B

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Existing Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Brentwood Blvd.	North of Delta	63.5	55.7	62.3	66.3
2	Brentwood Blvd.	Delta to Sims	63.6	55.8	62.4	66.5
3	Brentwood Blvd.	Sims to Lone Tree	63.7	55.9	62.5	66.6
4	Brentwood Blvd.	Lone Tree to Sunrise	62.8	55.0	61.6	65.6
5	Brentwood Blvd.	Sunrise to Gregory	64.5	56.7	63.3	67.3
6	Brentwood Blvd.	Gregory to Hanson	64.4	56.6	63.2	67.2
7	Brentwood Blvd.	Hanson to Homecoming	64.2	56.3	62.9	67.0
8	Brentwood Blvd.	Homecoming to Grant	64.3	56.4	63.0	67.1
9	Brentwood Blvd.	Grant to Sunset	64.3	56.5	63.1	67.2
10	Brentwood Blvd.	Sunset to Havenwood	64.6	56.7	63.3	67.4
11	Brentwood Blvd.	Havenwood to Applewood	66.7	58.9	65.5	69.5
12	Brentwood Blvd.	Applewood to Sand Creek	66.9	59.0	65.6	69.7
13	Brentwood Blvd.	Sand Creek to Technology	65.3	57.5	64.1	68.2
14	Brentwood Blvd.	Technology to Nancy	65.3	57.5	64.0	68.1
15	Brentwood Blvd.	Nancy to Village	65.4	57.5	64.1	68.2
16	Brentwood Blvd.	Village to Central / Sycamore	65.4	57.5	64.1	68.2
17	Brentwood Blvd.	Central / Sycamore to Spruce	64.5	56.6	63.2	67.3
18	Brentwood Blvd.	Pine to Maple	63.5	55.6	62.2	66.3
19	Brentwood Blvd.	Maple to Oak	63.4	55.5	62.1	66.2
20	Brentwood Blvd.	Oak to Second	62.8	55.0	61.6	65.6
21	Brentwood Blvd.	Second to Chestnut	63.4	55.5	62.1	66.2
22	Brentwood Blvd.	Chestnut to Balfour	62.7	54.9	61.4	65.5
23	Brentwood Blvd.	Balfour to Sunset	64.8	56.9	63.5	67.6

Appendix 4.4-B

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Existing Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Brentwood Blvd.	North of Delta	26	57	123	265	571
2	Brentwood Blvd.	Delta to Sims	27	58	125	270	581
3	Brentwood Blvd.	Sims to Lone Tree	27	59	127	274	589
4	Brentwood Blvd.	Lone Tree to Sunrise	24	51	110	237	511
5	Brentwood Blvd.	Sunrise to Gregory	31	67	143	309	665
6	Brentwood Blvd.	Gregory to Hanson	30	65	141	304	654
7	Brentwood Blvd.	Hanson to Homecoming	29	63	135	292	628
8	Brentwood Blvd.	Homecoming to Grant	30	64	138	298	641
9	Brentwood Blvd.	Grant to Sunset	30	65	139	300	646
10	Brentwood Blvd.	Sunset to Havenwood	31	67	145	312	671
11	Brentwood Blvd.	Havenwood to Applewood	32	70	150	324	698
12	Brentwood Blvd.	Applewood to Sand Creek	33	71	154	331	713
13	Brentwood Blvd.	Sand Creek to Technology	26	57	122	263	566
14	Brentwood Blvd.	Technology to Nancy	26	56	121	261	562
15	Brentwood Blvd.	Nancy to Village	26	57	122	264	568
16	Brentwood Blvd.	Village to Central / Sycamore	26	57	123	264	570
17	Brentwood Blvd.	Central / Sycamore to Spruce	23	50	107	230	496
18	Brentwood Blvd.	Pine to Maple	20	42	91	197	424
19	Brentwood Blvd.	Maple to Oak	19	42	90	194	418
20	Brentwood Blvd.	Oak to Second	18	38	83	178	384
21	Brentwood Blvd.	Second to Chestnut	19	42	90	195	419
22	Brentwood Blvd.	Chestnut to Balfour	17	38	81	175	377
23	Brentwood Blvd.	Balfour to Sunset	24	52	111	240	517

Appendix 4.4-B

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Existing Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Delta Road	West of Brentwood	0	83			2	1	25	100	
2	Delta Road	East of Brentwood	3,280	83		17	2	1	40	100	
3	Delta Road	West of Sellers	3,120	83		17	2	1	40	100	
4	Delta Road	East of Sellers	2,530	83		17	2	1	40	100	
5	Sellers Ave.	North of Delta	4,030	83		17	2	1	40	100	
6	Sellers Ave.	South of Delta	5,000	83		17	2	1	40	100	
7	Lone Tree Way	West of Brentwood	5,010	83		17	2	1	40	100	
8	Lone Tree Way	East of Brentwood	730	83		17	2	1	40	100	
9	Sunrse Drive	West of Brentwood	640	83		17	2	1	30	100	
10	Gregory Lane	West of Brentwood	1,150	83		17	2	1	30	100	
11	Hanson Lane	East of Brentwood	850	83		17	2	1	35	100	
12	Homecoming Way	East of Brentwood	220	83		17	2	1	25	100	
13	Grant/Sunset	West of Brentwood	2,440	83		17	2	1	40	100	
14	Grant/Sunset	East of Brentwood	5,340	83		17	2	1	40	100	
15	Havenwood Ave.	West of Brentwood	100	83		17	2	1	25	100	
16	Havenwood Ave.	East of Brentwood	640	83		17	2	1	30	100	
17	Applewood Common	West of Brentwood	350	83		17	2	1	25	100	
18	Applewood Common	East of Brentwood	1,190	83		17	2	1	25	100	
19	Sand Creek Road	West of Brentwood	6,110	83		17	2	1	40	100	
20	Sand Creek Road	East of Brentwood	0	83			2	1	40	100	
21	Technology Way	West of Brentwood	650	83		17	2	1	30	100	
22	Nancy Street	West of Brentwood	0	83			2	1	30	100	
23	Nancy Street	East of Brentwood	2,010	83		17	2	1	25	100	
24	Village Drive	East of Brentwood	1,000	83		17	2	1	25	100	

Appendix 4.4-B

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Existing Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
2	Delta Road	East of Brentwood	55.5	47.6	49.4	57.0
3	Delta Road	West of Sellers	55.3	47.3	49.2	56.7
4	Delta Road	East of Sellers	54.4	46.4	48.2	55.8
5	Sellers Ave.	North of Delta	56.4	48.4	50.3	57.9
6	Sellers Ave.	South of Delta	57.3	49.4	51.2	58.8
7	Lone Tree Way	West of Brentwood	57.3	49.4	51.2	58.8
8	Lone Tree Way	East of Brentwood	49.0	41.0	42.8	50.4
9	Sunrse Drive	West of Brentwood	44.8	38.5	42.6	47.4
10	Gregory Lane	West of Brentwood	47.3	41.1	45.2	50.0
11	Hanson Lane	East of Brentwood	48.0	40.8	43.0	49.7
12	Homecoming Way	East of Brentwood	37.9	32.6	37.3	41.2
13	Grant/Sunset	West of Brentwood	54.2	46.3	48.1	55.7
14	Grant/Sunset	East of Brentwood	57.6	49.7	51.5	59.1
15	Havenwood Ave.	West of Brentwood	34.4	29.2	33.8	37.8
16	Havenwood Ave.	East of Brentwood	44.8	38.5	42.6	47.4
17	Applewood Common	West of Brentwood	39.9	34.7	39.3	43.2
18	Applewood Common	East of Brentwood	45.2	40.0	44.6	48.6
19	Sand Creek Road	West of Brentwood	58.2	50.3	52.1	59.7
21	Technology Way	West of Brentwood	44.9	38.6	42.7	47.5
23	Nancy Street	East of Brentwood	47.5	42.2	46.9	50.8
24	Village Drive	East of Brentwood	44.4	39.2	43.8	47.8

Appendix 4.4-B

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Existing Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Distances to Traffic Noise Contours 75	70	65	60	55
2	Delta Road	East of Brentwood	6	14	29	63	135
3	Delta Road	West of Sellers	6	13	28	61	131
4	Delta Road	East of Sellers	5	11	24	53	114
5	Sellers Ave.	North of Delta	7	16	33	72	155
6	Sellers Ave.	South of Delta	8	18	39	83	179
7	Lone Tree Way	West of Brentwood	8	18	39	83	179
8	Lone Tree Way	East of Brentwood	2	5	11	23	50
9	Sunrse Drive	West of Brentwood	1	3	7	15	31
10	Gregory Lane	West of Brentwood	2	5	10	22	46
11	Hanson Lane	East of Brentwood	2	4	10	21	45
12	Homecoming Way	East of Brentwood	1	1	3	6	12
13	Grant/Sunset	West of Brentwood	5	11	24	52	111
14	Grant/Sunset	East of Brentwood	9	19	40	87	187
15	Havenwood Ave.	West of Brentwood	0	1	2	3	7
16	Havenwood Ave.	East of Brentwood	1	3	7	15	31
17	Applewood Common	West of Brentwood	1	2	4	8	16
18	Applewood Common	East of Brentwood	2	4	8	17	37
19	Sand Creek Road	West of Brentwood	10	20	44	95	205
21	Technology Way	West of Brentwood	1	3	7	15	32
23	Nancy Street	East of Brentwood	2	5	11	25	53
24	Village Drive	East of Brentwood	2	3	7	15	33

Appendix 4.4-B

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Existing Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Central/Sycamore	West of Brentwood	3,920	83		17	2	1	40	100	
2	Central/Sycamore	East of Brentwood	3,390	83		17	2	1	40	100	
3	Second Street	South of Central	7,360	83		17	2	1	40	100	
4	Central Blvd.	West of Second	4,320	83		17	2	1	40	100	
5	Central Blvd.	East of Second	5,460	83		17	2	1	40	100	
6	Central Blvd.	West of Walnut	6,070	83		17	2	1	40	100	
7	Central Blvd.	East of Walnut	8,860	83		17	2	1	40	100	
8	Walnut Blvd.	South of Central	4,060	83		17	2	1	40	100	
9	Pine Street	East of Brentwood	620	83		17	2	1	30	100	
10	Maple Street	West of Brentwood	0	83			2	1	30	100	
11	Maple Street	East of Brentwood	460	83		17	2	1	30	100	
12	Oak Street	West of Brentwood	8,830	83		17	2	1	30	100	
13	Oak Street	East of Brentwood	5,420	83		17	2	1	30	100	
14	Second Street	West of Brentwood	6,970	83		17	2	1	40	100	
15	Second Street	East of Brentwood	7,780	83		17	2	1	30	100	
16	Chestnut Street	East of Brentwood	880	83		17	2	1	30	100	
17	Balfour Road	West of Brentwood	22,130	83		17	2	1	40	100	
18	Balfour Road	East of Brentwood	11,300	83		17	2	1	40	100	
19	Sellers Ave.	North of Sunset	5,510	83		17	2	1	40	100	
20	Sellers Ave.	South of Sunset	2,580	83		17	2	1	40	100	
21	Sunset Road	West of Sellers	3,190	83		17	2	1	40	100	
22	Sunset Road	East of Sellers	2,400	83		17	2	1	40	100	

Appendix 4.4-B

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

Predicted Levels

Project #: 2007-056 Brentwood Blvd. SP
Description: Existing Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Central/Sycamore	West of Brentwood	56.3	48.3	50.1	57.7
2	Central/Sycamore	East of Brentwood	55.6	47.7	49.5	57.1
3	Second Street	South of Central	59.0	51.1	52.9	60.5
4	Central Blvd.	West of Second	56.7	48.7	50.6	58.2
5	Central Blvd.	East of Second	57.7	49.8	51.6	59.2
6	Central Blvd.	West of Walnut	58.2	50.2	52.0	59.6
7	Central Blvd.	East of Walnut	59.8	51.9	53.7	61.3
8	Walnut Blvd.	South of Central	56.4	48.5	50.3	57.9
9	Pine Street	East of Brentwood	44.7	38.4	42.5	47.3
11	Maple Street	East of Brentwood	43.4	37.1	41.2	46.0
12	Oak Street	West of Brentwood	56.2	49.9	54.0	58.8
13	Oak Street	East of Brentwood	54.1	47.8	51.9	56.7
14	Second Street	West of Brentwood	58.8	50.8	52.6	60.2
15	Second Street	East of Brentwood	55.6	49.4	53.5	58.3
16	Chestnut Street	East of Brentwood	46.2	39.9	44.0	48.8
17	Balfour Road	West of Brentwood	63.8	55.8	57.7	65.3
18	Balfour Road	East of Brentwood	60.9	52.9	54.7	62.3
19	Sellers Ave.	North of Sunset	57.7	49.8	51.6	59.2
20	Sellers Ave.	South of Sunset	54.4	46.5	48.3	55.9
21	Sunset Road	West of Sellers	55.4	47.4	49.2	56.8
22	Sunset Road	East of Sellers	54.1	46.2	48.0	55.6

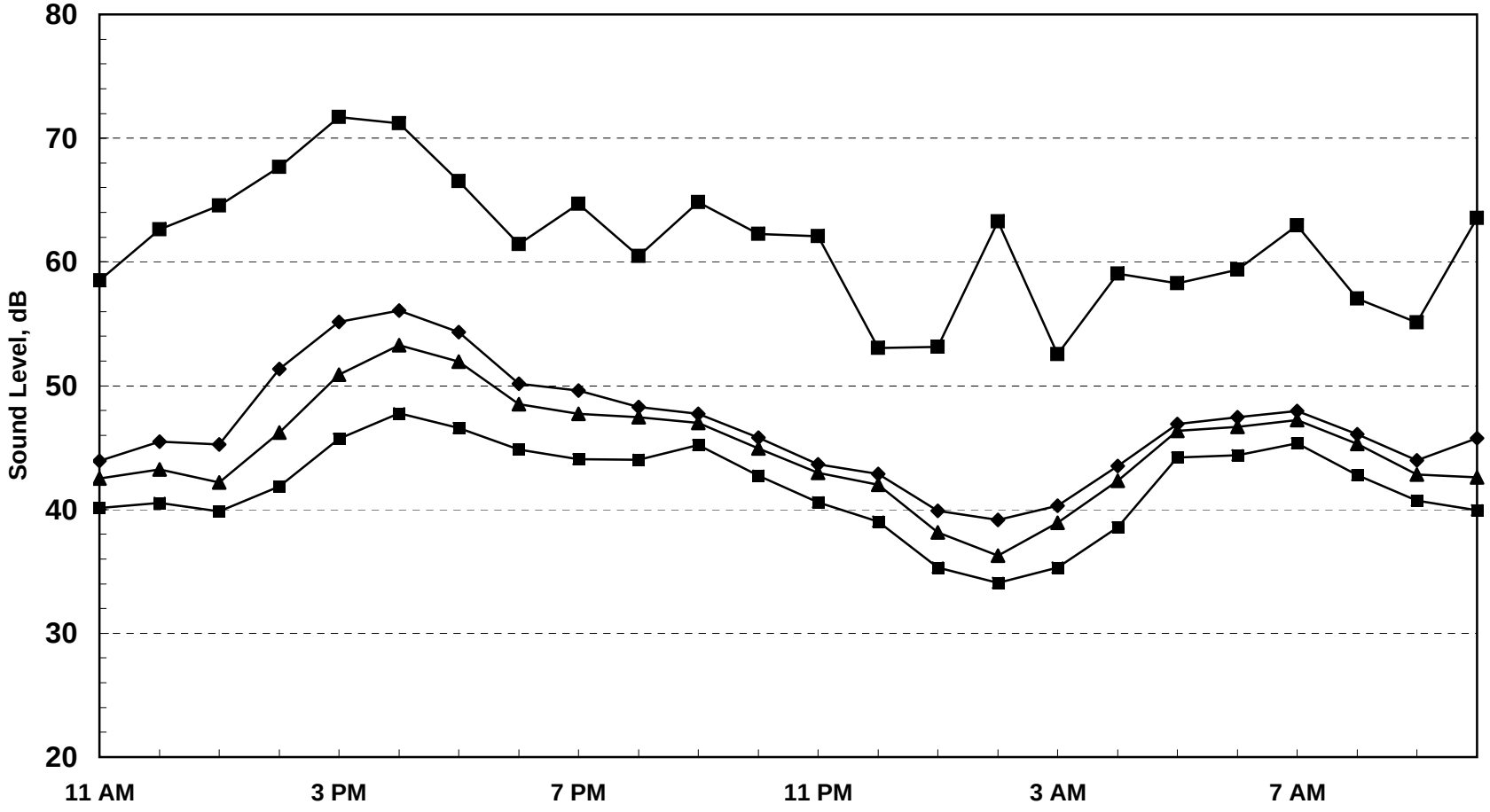
Appendix 4.4-B

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Existing Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Central/Sycamore	West of Brentwood	7	15	33	71	152
2	Central/Sycamore	East of Brentwood	6	14	30	64	138
3	Second Street	South of Central	11	23	50	108	232
4	Central Blvd.	West of Second	8	16	35	75	162
5	Central Blvd.	East of Second	9	19	41	88	190
6	Central Blvd.	West of Walnut	9	20	44	95	204
7	Central Blvd.	East of Walnut	12	26	56	122	262
8	Walnut Blvd.	South of Central	7	16	34	72	156
9	Pine Street	East of Brentwood	1	3	7	14	31
11	Maple Street	East of Brentwood	1	3	5	12	25
12	Oak Street	West of Brentwood	8	18	39	84	180
13	Oak Street	East of Brentwood	6	13	28	60	130
14	Second Street	West of Brentwood	10	22	48	104	223
15	Second Street	East of Brentwood	8	17	36	77	166
16	Chestnut Street	East of Brentwood	2	4	8	18	39
17	Balfour Road	West of Brentwood	22	48	104	224	483
18	Balfour Road	East of Brentwood	14	31	66	143	308
19	Sellers Ave.	North of Sunset	9	19	41	89	191
20	Sellers Ave.	South of Sunset	5	12	25	53	115
21	Sunset Road	West of Sellers	6	13	29	62	133
22	Sunset Road	East of Sellers	5	11	24	51	110

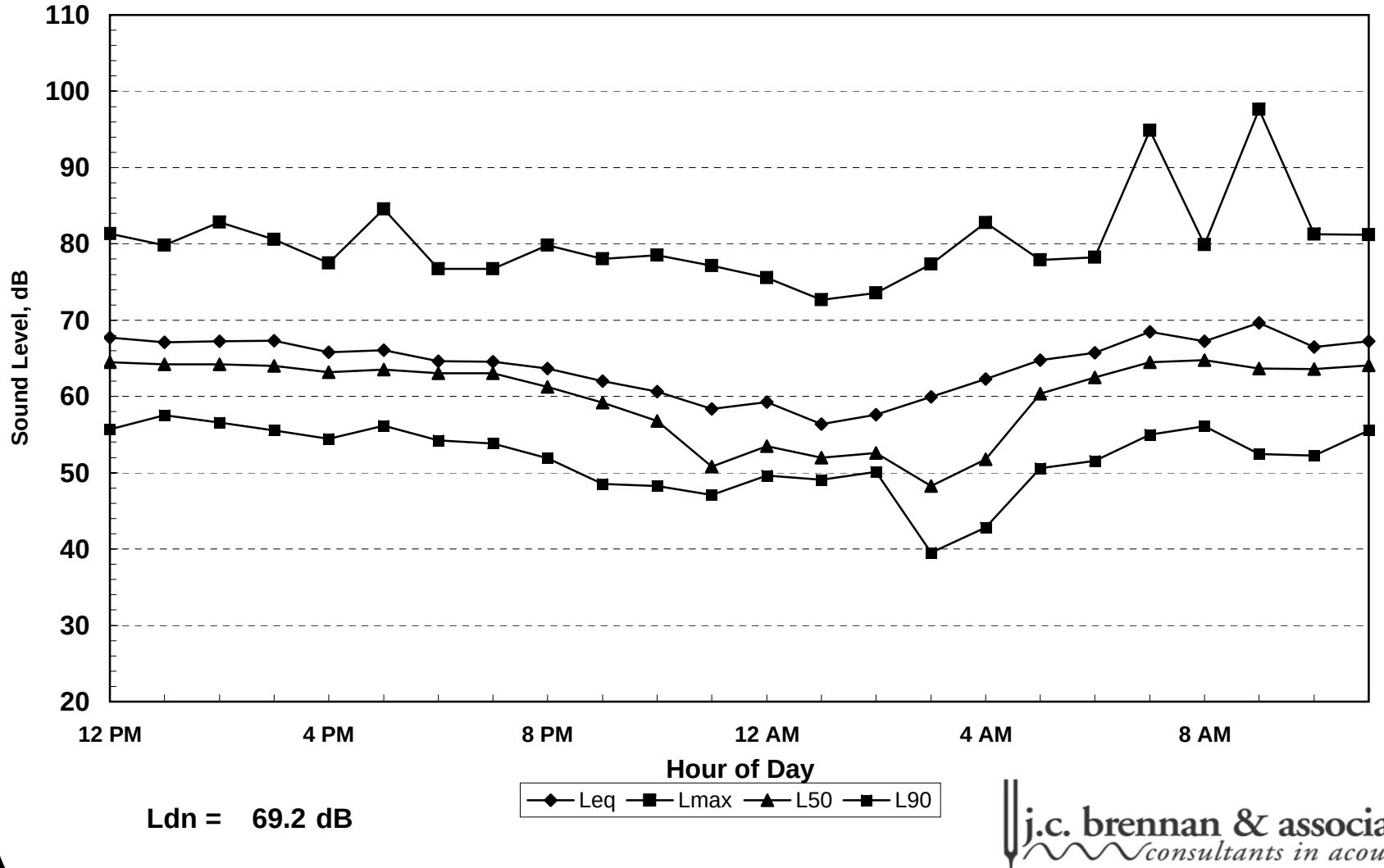
Appendix 4.4-C
24hr Continuous Noise Monitoring
Brentwood Boulevard SP 3 - Site A
August 1-2, 2007



Ldn = 52.3 dB

j.c. brennan & associates
consultants in acoustics

Appendix 4.4-C
24hr Continuous Noise Monitoring
Brentwood Boulevard SP 3 - Site B
August 1-2, 2007



Ldn = 69.2 dB

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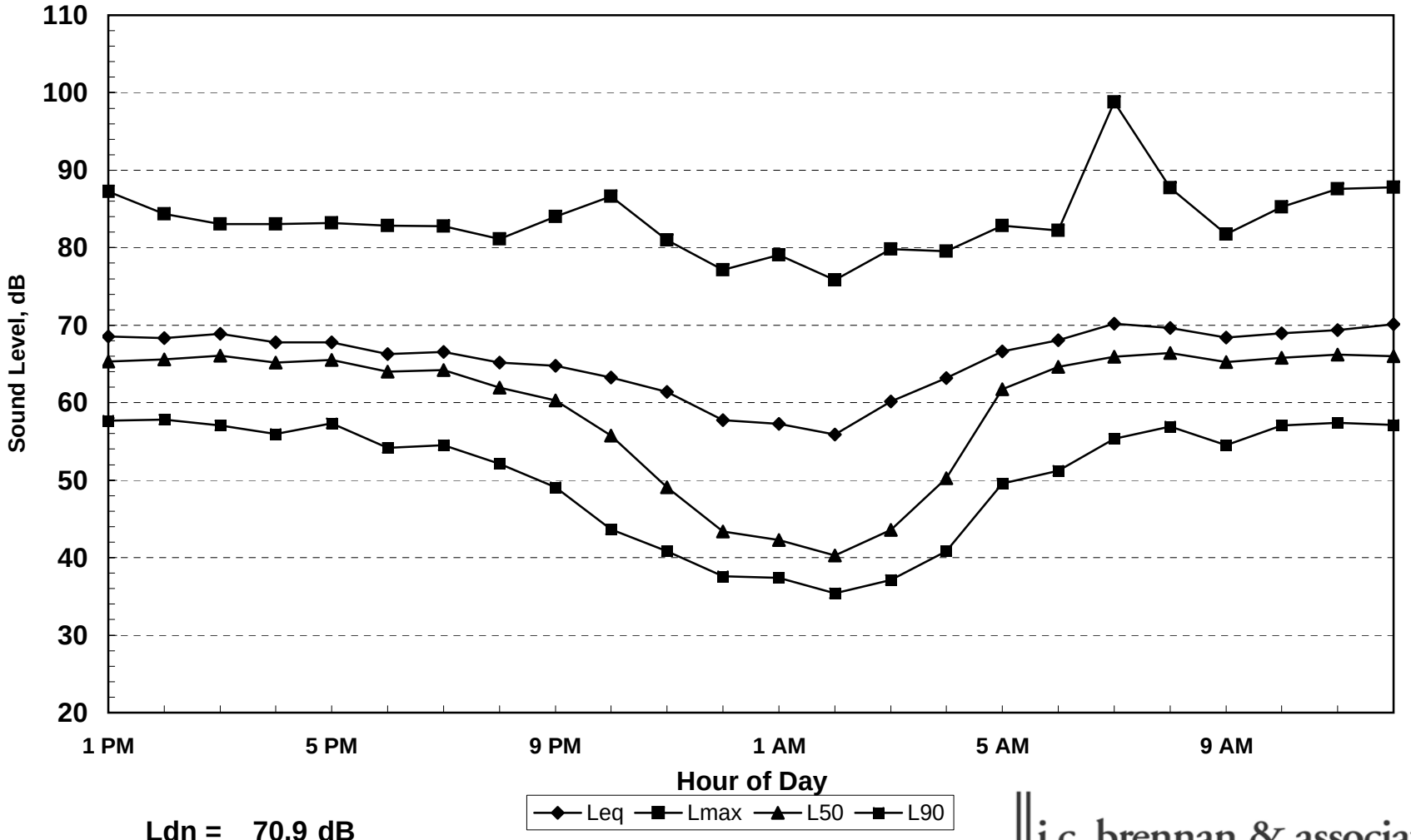
Appendix 4.4-C
24hr Continuous Noise Monitoring
Brentwood Boulevard SP 3 - Site C
August 1-2, 2007



Ldn = 70.9 dB

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Appendix 4.4-D

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Brentwood Blvd.	North of Delta	25,943	83		17	2	3	40	100	
2	Brentwood Blvd.	Delta to Sims	26,514	83		17	2	3	40	100	
3	Brentwood Blvd.	Sims to Lone Tree	27,343	83		17	2	3	40	100	
4	Brentwood Blvd.	Lone Tree to Sunrise	26,494	83		17	2	3	40	100	
5	Brentwood Blvd.	Sunrise to Gregory	35,498	83		17	2	3	40	100	
6	Brentwood Blvd.	Gregory to Hanson	35,094	83		17	2	3	40	100	
7	Brentwood Blvd.	Hanson to Homecoming	33,810	83		17	2	3	40	100	
8	Brentwood Blvd.	Homecoming to Grant	34,820	83		17	2	3	40	100	
9	Brentwood Blvd.	Grant to Sunset	35,556	83		17	2	3	40	100	
10	Brentwood Blvd.	Sunset to Havenwood	37,114	83		17	2	3	40	100	
11	Brentwood Blvd.	Havenwood to Applewood	39,076	83		17	2	3	40	75	
12	Brentwood Blvd.	Applewood to Sand Creek	40,418	83		17	2	3	40	75	
13	Brentwood Blvd.	Sand Creek to Technology	31,356	83		17	2	3	40	75	
14	Brentwood Blvd.	Technology to Nancy	31,342	83		17	2	3	40	75	
15	Brentwood Blvd.	Nancy to Village	32,107	83		17	2	3	40	75	
16	Brentwood Blvd.	Village to Central / Sycamore	32,165	83		17	2	3	40	75	
17	Brentwood Blvd.	Central / Sycamore to Spruce	24,943	83		17	2	3	40	75	
18	Brentwood Blvd.	Pine to Maple	19,433	83		17	2	3	40	75	
19	Brentwood Blvd.	Maple to Oak	18,789	83		17	2	3	40	75	
20	Brentwood Blvd.	Oak to Second	17,444	83		17	2	3	40	75	
21	Brentwood Blvd.	Second to Chestnut	18,912	83		17	2	3	40	75	
22	Brentwood Blvd.	Chestnut to Balfour	17,252	83		17	2	3	40	75	
23	Brentwood Blvd.	Balfour to Sunset	21,002	83		17	2	3	40	75	

Appendix 4.4-D

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Brentwood Blvd.	North of Delta	64.4	56.5	63.1	67.2
2	Brentwood Blvd.	Delta to Sims	64.5	56.6	63.2	67.3
3	Brentwood Blvd.	Sims to Lone Tree	64.6	56.8	63.3	67.4
4	Brentwood Blvd.	Lone Tree to Sunrise	64.5	56.6	63.2	67.3
5	Brentwood Blvd.	Sunrise to Gregory	65.7	57.9	64.5	68.6
6	Brentwood Blvd.	Gregory to Hanson	65.7	57.8	64.4	68.5
7	Brentwood Blvd.	Hanson to Homecoming	65.5	57.7	64.3	68.3
8	Brentwood Blvd.	Homecoming to Grant	65.7	57.8	64.4	68.5
9	Brentwood Blvd.	Grant to Sunset	65.7	57.9	64.5	68.6
10	Brentwood Blvd.	Sunset to Havenwood	65.9	58.1	64.7	68.7
11	Brentwood Blvd.	Havenwood to Applewood	68.0	60.2	66.8	70.8
12	Brentwood Blvd.	Applewood to Sand Creek	68.2	60.3	66.9	71.0
13	Brentwood Blvd.	Sand Creek to Technology	67.1	59.2	65.8	69.9
14	Brentwood Blvd.	Technology to Nancy	67.1	59.2	65.8	69.9
15	Brentwood Blvd.	Nancy to Village	67.2	59.3	65.9	70.0
16	Brentwood Blvd.	Village to Central / Sycamore	67.2	59.3	65.9	70.0
17	Brentwood Blvd.	Central / Sycamore to Spruce	66.1	58.2	64.8	68.9
18	Brentwood Blvd.	Pine to Maple	65.0	57.2	63.7	67.8
19	Brentwood Blvd.	Maple to Oak	64.9	57.0	63.6	67.7
20	Brentwood Blvd.	Oak to Second	64.5	56.7	63.3	67.3
21	Brentwood Blvd.	Second to Chestnut	64.9	57.0	63.6	67.7
22	Brentwood Blvd.	Chestnut to Balfour	64.5	56.6	63.2	67.3
23	Brentwood Blvd.	Balfour to Sunset	65.3	57.5	64.1	68.2

Appendix 4.4-D

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Brentwood Blvd.	North of Delta	30	65	140	302	650
2	Brentwood Blvd.	Delta to Sims	31	66	142	306	660
3	Brentwood Blvd.	Sims to Lone Tree	31	67	145	313	673
4	Brentwood Blvd.	Lone Tree to Sunrise	31	66	142	306	659
5	Brentwood Blvd.	Sunrise to Gregory	37	80	173	372	801
6	Brentwood Blvd.	Gregory to Hanson	37	80	171	369	795
7	Brentwood Blvd.	Hanson to Homecoming	36	78	167	360	776
8	Brentwood Blvd.	Homecoming to Grant	37	79	170	367	791
9	Brentwood Blvd.	Grant to Sunset	37	80	173	372	802
10	Brentwood Blvd.	Sunset to Havenwood	38	83	178	383	825
11	Brentwood Blvd.	Havenwood to Applewood	40	85	184	396	854
12	Brentwood Blvd.	Applewood to Sand Creek	41	87	188	406	874
13	Brentwood Blvd.	Sand Creek to Technology	34	74	159	342	738
14	Brentwood Blvd.	Technology to Nancy	34	74	159	342	737
15	Brentwood Blvd.	Nancy to Village	35	75	161	348	749
16	Brentwood Blvd.	Village to Central / Sycamore	35	75	162	348	750
17	Brentwood Blvd.	Central / Sycamore to Spruce	29	63	136	294	633
18	Brentwood Blvd.	Pine to Maple	25	54	116	249	536
19	Brentwood Blvd.	Maple to Oak	24	52	113	243	524
20	Brentwood Blvd.	Oak to Second	23	50	107	232	499
21	Brentwood Blvd.	Second to Chestnut	24	53	113	244	527
22	Brentwood Blvd.	Chestnut to Balfour	23	50	107	230	495
23	Brentwood Blvd.	Balfour to Sunset	26	56	122	262	565

Appendix 4.4-D

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Delta Road	West of Brentwood	0	83			2	1	25	100	
2	Delta Road	East of Brentwood	3,280	83		17	2	1	40	100	
3	Delta Road	West of Sellers	3,120	83		17	2	1	40	100	
4	Delta Road	East of Sellers	2,530	83		17	2	1	40	100	
5	Sellers Ave.	North of Brentwood	4,030	83		17	2	1	40	100	
6	Sellers Ave.	South of Brentwood	5,000	83		17	2	1	40	100	
7	Lone Tree Way	West of Brentwood	7,020	83		17	2	1	40	100	
8	Lone Tree Way	East of Brentwood	1,090	83		17	2	1	40	100	
9	Sunrse Drive	West of Brentwood	970	83		17	2	1	30	100	
10	Gregory Lane	West of Brentwood	1,350	83		17	2	1	30	100	
11	Hanson Lane	East of Brentwood	1,060	83		17	2	1	35	100	
12	Homecoming Way	East of Brentwood	420	83		17	2	1	25	100	
13	Grant/Sunset	West of Brentwood	2,440	83		17	2	1	40	100	
14	Grant/Sunset	East of Brentwood	7,940	83		17	2	1	40	100	
15	Havenwood Ave.	West of Brentwood	100	83		17	2	1	25	100	
16	Havenwood Ave.	East of Brentwood	3,140	83		17	2	1	30	100	
17	Applewood Common	West of Brentwood	350	83		17	2	1	25	100	
18	Applewood Common	East of Brentwood	1,490	83		17	2	1	25	100	
19	Sand Creek Road	West of Brentwood	8,640	83		17	2	1	40	100	
20	Sand Creek Road	East of Brentwood	0	83			2	1	40	100	
21	Technology Way	West of Brentwood	1,250	83		17	2	1	30	100	
22	Nancy Street	West of Brentwood	0	83			2	1	30	100	
23	Nancy Street	East of Brentwood	2,610	83		17	2	1	25	100	
24	Village Drive	East of Brentwood	1,000	83		17	2	1	25	100	

Appendix 4.4-D

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
2	Delta Road	East of Brentwood	55.5	47.6	49.4	57.0
3	Delta Road	West of Sellers	55.3	47.3	49.2	56.7
4	Delta Road	East of Sellers	54.4	46.4	48.2	55.8
5	Sellers Ave.	North of Brentwood	56.4	48.4	50.3	57.9
6	Sellers Ave.	South of Brentwood	57.3	49.4	51.2	58.8
7	Lone Tree Way	West of Brentwood	58.8	50.9	52.7	60.3
8	Lone Tree Way	East of Brentwood	50.7	42.8	44.6	52.2
9	Sunrse Drive	West of Brentwood	46.6	40.3	44.4	49.3
10	Gregory Lane	West of Brentwood	48.0	41.7	45.9	50.7
11	Hanson Lane	East of Brentwood	48.9	41.7	43.9	50.7
12	Homecoming Way	East of Brentwood	40.7	35.4	40.1	44.0
13	Grant/Sunset	West of Brentwood	54.2	46.3	48.1	55.7
14	Grant/Sunset	East of Brentwood	59.3	51.4	53.2	60.8
15	Havenwood Ave.	West of Brentwood	34.4	29.2	33.8	37.8
16	Havenwood Ave.	East of Brentwood	51.7	45.4	49.5	54.4
17	Applewood Common	West of Brentwood	39.9	34.7	39.3	43.2
18	Applewood Common	East of Brentwood	46.2	40.9	45.6	49.5
19	Sand Creek Road	West of Brentwood	59.7	51.8	53.6	61.2
21	Technology Way	West of Brentwood	47.7	41.4	45.5	50.4
23	Nancy Street	East of Brentwood	48.6	43.4	48.0	52.0
24	Village Drive	East of Brentwood	44.4	39.2	43.8	47.8

Appendix 4.4-D

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Distances to Traffic Noise Contours 75	70	65	60	55
2	Delta Road	East of Brentwood	6	14	29	63	135
3	Delta Road	West of Sellers	6	13	28	61	131
4	Delta Road	East of Sellers	5	11	24	53	114
5	Sellers Ave.	North of Brentwood	7	16	33	72	155
6	Sellers Ave.	South of Brentwood	8	18	39	83	179
7	Lone Tree Way	West of Brentwood	10	22	48	104	225
8	Lone Tree Way	East of Brentwood	3	6	14	30	65
9	Sunrse Drive	West of Brentwood	2	4	9	19	41
10	Gregory Lane	West of Brentwood	2	5	11	24	52
11	Hanson Lane	East of Brentwood	2	5	11	24	52
12	Homecoming Way	East of Brentwood	1	2	4	9	19
13	Grant/Sunset	West of Brentwood	5	11	24	52	111
14	Grant/Sunset	East of Brentwood	11	24	53	113	244
15	Havenwood Ave.	West of Brentwood	0	1	2	3	7
16	Havenwood Ave.	East of Brentwood	4	9	20	42	91
17	Applewood Common	West of Brentwood	1	2	4	8	16
18	Applewood Common	East of Brentwood	2	4	9	20	43
19	Sand Creek Road	West of Brentwood	12	26	56	120	258
21	Technology Way	West of Brentwood	2	5	11	23	49
23	Nancy Street	East of Brentwood	3	6	14	29	63
24	Village Drive	East of Brentwood	2	3	7	15	33

Appendix 4.4-D

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Central/Sycamore	West of Brentwood	6,620	83		17	2	1	40	100	
2	Central/Sycamore	East of Brentwood	5,410	83		17	2	1	40	100	
3	Second Street	South of Central	8,320	83		17	2	1	40	100	
4	Central Blvd.	West of Second	7,980	83		17	2	1	40	100	
5	Central Blvd.	East of Second	8,160	83		17	2	1	40	100	
6	Central Blvd.	West of Walnut	9,110	83		17	2	1	40	100	
7	Central Blvd.	East of Walnut	12,340	83		17	2	1	40	100	
8	Walnut Blvd.	South of Central	4,700	83		17	2	1	40	100	
9	Pine Street	East of Brentwood	700	83		17	2	1	30	100	
10	Maple Street	West of Brentwood	0	83			2	1	30	100	
11	Maple Street	East of Brentwood	900	83		17	2	1	30	100	
12	Oak Street	West of Brentwood	10,030	83		17	2	1	30	100	
13	Oak Street	East of Brentwood	5,970	83		17	2	1	30	100	
14	Second Street	West of Brentwood	7,930	83		17	2	1	40	100	
15	Second Street	East of Brentwood	8,730	83		17	2	1	30	100	
16	Chestnut Street	East of Brentwood	1,190	83		17	2	1	30	100	
17	Balfour Road	West of Brentwood	24,040	83		17	2	1	40	100	
18	Balfour Road	East of Brentwood	13,370	83		17	2	1	40	100	
19	Sellers Ave.	North of Sunset	5,510	83		17	2	1	40	100	
20	Sellers Ave.	South of Sunset	2,650	83		17	2	1	40	100	
21	Sunset Road	West of Sellers	3,260	83		17	2	1	40	100	
22	Sunset Road	East of Sellers	2,400	83		17	2	1	40	100	

Appendix 4.4-D

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Central/Sycamore	West of Brentwood	58.5	50.6	52.4	60.0
2	Central/Sycamore	East of Brentwood	57.7	49.7	51.5	59.1
3	Second Street	South of Central	59.5	51.6	53.4	61.0
4	Central Blvd.	West of Second	59.3	51.4	53.2	60.8
5	Central Blvd.	East of Second	59.4	51.5	53.3	60.9
6	Central Blvd.	West of Walnut	59.9	52.0	53.8	61.4
7	Central Blvd.	East of Walnut	61.2	53.3	55.1	62.7
8	Walnut Blvd.	South of Central	57.0	49.1	50.9	58.5
9	Pine Street	East of Brentwood	45.2	38.9	43.0	47.8
11	Maple Street	East of Brentwood	46.3	40.0	44.1	48.9
12	Oak Street	West of Brentwood	56.7	50.5	54.6	59.4
13	Oak Street	East of Brentwood	54.5	48.2	52.3	57.1
14	Second Street	West of Brentwood	59.3	51.4	53.2	60.8
15	Second Street	East of Brentwood	56.1	49.9	54.0	58.8
16	Chestnut Street	East of Brentwood	47.5	41.2	45.3	50.1
17	Balfour Road	West of Brentwood	64.1	56.2	58.0	65.6
18	Balfour Road	East of Brentwood	61.6	53.7	55.5	63.1
19	Sellers Ave.	North of Sunset	57.7	49.8	51.6	59.2
20	Sellers Ave.	South of Sunset	54.6	46.6	48.4	56.0
21	Sunset Road	West of Sellers	55.5	47.5	49.3	56.9
22	Sunset Road	East of Sellers	54.1	46.2	48.0	55.6

Appendix 4.4-D

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Central/Sycamore	West of Brentwood	10	22	47	100	216
2	Central/Sycamore	East of Brentwood	9	19	41	88	189
3	Second Street	South of Central	12	25	54	117	251
4	Central Blvd.	West of Second	11	24	53	114	245
5	Central Blvd.	East of Second	12	25	53	115	248
6	Central Blvd.	West of Walnut	12	27	58	124	267
7	Central Blvd.	East of Walnut	15	33	70	152	327
8	Walnut Blvd.	South of Central	8	17	37	80	172
9	Pine Street	East of Brentwood	2	3	7	15	33
11	Maple Street	East of Brentwood	2	4	8	18	39
12	Oak Street	West of Brentwood	9	20	42	91	196
13	Oak Street	East of Brentwood	6	14	30	64	139
14	Second Street	West of Brentwood	11	24	52	113	244
15	Second Street	East of Brentwood	8	18	39	83	179
16	Chestnut Street	East of Brentwood	2	5	10	22	47
17	Balfour Road	West of Brentwood	24	51	110	237	510
18	Balfour Road	East of Brentwood	16	34	74	160	345
19	Sellers Ave.	North of Sunset	9	19	41	89	191
20	Sellers Ave.	South of Sunset	5	12	25	54	117
21	Sunset Road	West of Sellers	6	13	29	62	135
22	Sunset Road	East of Sellers	5	11	24	51	110

Appendix 4.4-E

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline + Project Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Brentwood Blvd.	North of Delta	38,586	83		17	2	3	40	100	
2	Brentwood Blvd.	Delta to Sims	44,429	83		17	2	3	40	100	
3	Brentwood Blvd.	Sims to Lone Tree	49,286	83		17	2	3	40	100	
4	Brentwood Blvd.	Lone Tree to Sunrise	57,027	83		17	2	3	40	100	
5	Brentwood Blvd.	Sunrise to Gregory	66,104	83		17	2	3	40	100	
6	Brentwood Blvd.	Gregory to Hanson	65,743	83		17	2	3	40	100	
7	Brentwood Blvd.	Hanson to Homecoming	64,574	83		17	2	3	40	100	
8	Brentwood Blvd.	Homecoming to Grant	65,642	83		17	2	3	40	100	
9	Brentwood Blvd.	Grant to Sunset	66,753	83		17	2	3	40	100	
10	Brentwood Blvd.	Sunset to Havenwood	68,297	83		17	2	3	40	100	
11	Brentwood Blvd.	Havenwood to Applewood	70,649	83		17	2	3	40	75	
12	Brentwood Blvd.	Applewood to Sand Creek	71,746	83		17	2	3	40	75	
13	Brentwood Blvd.	Sand Creek to Technology	51,991	83		17	2	3	40	75	
14	Brentwood Blvd.	Technology to Nancy	50,895	83		17	2	3	40	75	
15	Brentwood Blvd.	Nancy to Village	49,322	83		17	2	3	40	75	
16	Brentwood Blvd.	Village to Central / Sycamore	48,571	83		17	2	3	40	75	
17	Brentwood Blvd.	Central / Sycamore to Spruce	36,729	83		17	2	3	40	75	
18	Brentwood Blvd.	Pine to Maple	28,256	83		17	2	3	40	75	
19	Brentwood Blvd.	Maple to Oak	27,611	83		17	2	3	40	75	
20	Brentwood Blvd.	Oak to Second	23,889	83		17	2	3	40	75	
21	Brentwood Blvd.	Second to Chestnut	27,478	83		17	2	3	40	75	
22	Brentwood Blvd.	Chestnut to Balfour	23,502	83		17	2	3	40	75	
23	Brentwood Blvd.	Balfour to Sunset	26,724	83		17	2	3	40	75	

Appendix 4.4-E

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline + Project Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Brentwood Blvd.	North of Delta	66.1	58.3	64.8	68.9
2	Brentwood Blvd.	Delta to Sims	66.7	58.9	65.5	69.5
3	Brentwood Blvd.	Sims to Lone Tree	67.2	59.3	65.9	70.0
4	Brentwood Blvd.	Lone Tree to Sunrise	67.8	60.0	66.5	70.6
5	Brentwood Blvd.	Sunrise to Gregory	68.4	60.6	67.2	71.3
6	Brentwood Blvd.	Gregory to Hanson	68.4	60.6	67.2	71.2
7	Brentwood Blvd.	Hanson to Homecoming	68.3	60.5	67.1	71.2
8	Brentwood Blvd.	Homecoming to Grant	68.4	60.6	67.2	71.2
9	Brentwood Blvd.	Grant to Sunset	68.5	60.6	67.2	71.3
10	Brentwood Blvd.	Sunset to Havenwood	68.6	60.7	67.3	71.4
11	Brentwood Blvd.	Havenwood to Applewood	70.6	62.8	69.3	73.4
12	Brentwood Blvd.	Applewood to Sand Creek	70.7	62.8	69.4	73.5
13	Brentwood Blvd.	Sand Creek to Technology	69.3	61.4	68.0	72.1
14	Brentwood Blvd.	Technology to Nancy	69.2	61.3	67.9	72.0
15	Brentwood Blvd.	Nancy to Village	69.0	61.2	67.8	71.9
16	Brentwood Blvd.	Village to Central / Sycamore	69.0	61.1	67.7	71.8
17	Brentwood Blvd.	Central / Sycamore to Spruce	67.8	59.9	66.5	70.6
18	Brentwood Blvd.	Pine to Maple	66.6	58.8	65.4	69.4
19	Brentwood Blvd.	Maple to Oak	66.5	58.7	65.3	69.3
20	Brentwood Blvd.	Oak to Second	65.9	58.1	64.6	68.7
21	Brentwood Blvd.	Second to Chestnut	66.5	58.7	65.2	69.3
22	Brentwood Blvd.	Chestnut to Balfour	65.8	58.0	64.6	68.6
23	Brentwood Blvd.	Balfour to Sunset	66.4	58.5	65.1	69.2

Appendix 4.4-E

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline + Project Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Brentwood Blvd.	North of Delta	39	85	182	393	847
2	Brentwood Blvd.	Delta to Sims	43	93	200	432	931
3	Brentwood Blvd.	Sims to Lone Tree	46	100	215	463	997
4	Brentwood Blvd.	Lone Tree to Sunrise	51	110	237	510	1099
5	Brentwood Blvd.	Sunrise to Gregory	56	121	261	563	1213
6	Brentwood Blvd.	Gregory to Hanson	56	121	260	561	1208
7	Brentwood Blvd.	Hanson to Homecoming	55	119	257	554	1194
8	Brentwood Blvd.	Homecoming to Grant	56	121	260	560	1207
9	Brentwood Blvd.	Grant to Sunset	57	122	263	567	1221
10	Brentwood Blvd.	Sunset to Havenwood	58	124	267	575	1239
11	Brentwood Blvd.	Havenwood to Applewood	59	127	273	588	1268
12	Brentwood Blvd.	Applewood to Sand Creek	59	128	276	595	1281
13	Brentwood Blvd.	Sand Creek to Technology	48	103	223	480	1033
14	Brentwood Blvd.	Technology to Nancy	47	102	219	473	1019
15	Brentwood Blvd.	Nancy to Village	46	100	215	463	998
16	Brentwood Blvd.	Village to Central / Sycamore	46	99	213	458	988
17	Brentwood Blvd.	Central / Sycamore to Spruce	38	82	177	380	820
18	Brentwood Blvd.	Pine to Maple	32	69	148	319	688
19	Brentwood Blvd.	Maple to Oak	31	68	146	315	678
20	Brentwood Blvd.	Oak to Second	29	62	133	286	615
21	Brentwood Blvd.	Second to Chestnut	31	68	146	314	675
22	Brentwood Blvd.	Chestnut to Balfour	28	61	131	283	609
23	Brentwood Blvd.	Balfour to Sunset	31	66	143	308	663

Appendix 4.4-E

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline + Project Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Delta Road	West of Brentwood	0	83			2	1	25	100	
2	Delta Road	East of Brentwood	9,070	83		17	2	1	40	100	
3	Delta Road	West of Sellers	3,980	83		17	2	1	40	100	
4	Delta Road	East of Sellers	3,860	83		17	2	1	40	100	
5	Sellers Ave.	North of Brentwood	4,030	83		17	2	1	40	100	
6	Sellers Ave.	South of Brentwood	5,570	83		17	2	1	40	100	
7	Lone Tree Way	West of Brentwood	17,630	83		17	2	1	40	100	
8	Lone Tree Way	East of Brentwood	6,380	83		17	2	1	40	100	
9	Sunrse Drive	West of Brentwood	1,640	83		17	2	1	30	100	
10	Gregory Lane	West of Brentwood	2,020	83		17	2	1	30	100	
11	Hanson Lane	East of Brentwood	1,730	83		17	2	1	35	100	
12	Homecoming Way	East of Brentwood	1,090	83		17	2	1	25	100	
13	Grant/Sunset	West of Brentwood	5,250	83		17	2	1	40	100	
14	Grant/Sunset	East of Brentwood	8,890	83		17	2	1	40	100	
15	Havenwood Ave.	West of Brentwood	770	83		17	2	1	25	100	
16	Havenwood Ave.	East of Brentwood	4,120	83		17	2	1	30	100	
17	Applewood Common	West of Brentwood	2,810	83		17	2	1	25	100	
18	Applewood Common	East of Brentwood	2,580	83		17	2	1	25	100	
19	Sand Creek Road	West of Brentwood	19,760	83		17	2	1	40	100	
20	Sand Creek Road	East of Brentwood	5,420	83		17	2	1	40	100	
21	Technology Way	West of Brentwood	2,510	83		17	2	1	30	100	
22	Nancy Street	West of Brentwood	2,030	83		17	2	1	30	100	
23	Nancy Street	East of Brentwood	3,690	83		17	2	1	25	100	
24	Village Drive	East of Brentwood	2,080	83		17	2	1	25	100	

Appendix 4.4-E

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline + Project Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
2	Delta Road	East of Brentwood	59.9	52.0	53.8	61.4
3	Delta Road	West of Sellers	56.3	48.4	50.2	57.8
4	Delta Road	East of Sellers	56.2	48.3	50.1	57.7
5	Sellers Ave.	North of Brentwood	56.4	48.4	50.3	57.9
6	Sellers Ave.	South of Brentwood	57.8	49.9	51.7	59.3
7	Lone Tree Way	West of Brentwood	62.8	54.9	56.7	64.3
8	Lone Tree Way	East of Brentwood	58.4	50.4	52.3	59.9
9	Sunrse Drive	West of Brentwood	48.9	42.6	46.7	51.5
10	Gregory Lane	West of Brentwood	49.8	43.5	47.6	52.4
11	Hanson Lane	East of Brentwood	51.0	43.9	46.1	52.8
12	Homecoming Way	East of Brentwood	44.8	39.6	44.2	48.2
13	Grant/Sunset	West of Brentwood	57.5	49.6	51.4	59.0
14	Grant/Sunset	East of Brentwood	59.8	51.9	53.7	61.3
15	Havenwood Ave.	West of Brentwood	43.3	38.1	42.7	46.7
16	Havenwood Ave.	East of Brentwood	52.9	46.6	50.7	55.5
17	Applewood Common	West of Brentwood	48.9	43.7	48.3	52.3
18	Applewood Common	East of Brentwood	48.6	43.3	47.9	51.9
19	Sand Creek Road	West of Brentwood	63.3	55.4	57.2	64.8
20	Sand Creek Road	East of Brentwood	57.7	49.7	51.5	59.1
21	Technology Way	West of Brentwood	50.7	44.4	48.6	53.4
22	Nancy Street	West of Brentwood	49.8	43.5	47.6	52.5
23	Nancy Street	East of Brentwood	50.1	44.9	49.5	53.5
24	Village Drive	East of Brentwood	47.6	42.4	47.0	51.0

Appendix 4.4-E

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline + Project Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Distances to Traffic Noise Contours 75	70	65	60	55
2	Delta Road	East of Brentwood	12	27	57	124	266
3	Delta Road	West of Sellers	7	15	33	71	154
4	Delta Road	East of Sellers	7	15	32	70	151
5	Sellers Ave.	North of Brentwood	7	16	33	72	155
6	Sellers Ave.	South of Brentwood	9	19	41	89	192
7	Lone Tree Way	West of Brentwood	19	41	89	193	415
8	Lone Tree Way	East of Brentwood	10	21	45	98	211
9	Sunrse Drive	West of Brentwood	3	6	13	27	59
10	Gregory Lane	West of Brentwood	3	7	15	31	67
11	Hanson Lane	East of Brentwood	3	7	15	33	72
12	Homecoming Way	East of Brentwood	2	4	8	16	35
13	Grant/Sunset	West of Brentwood	9	18	40	86	185
14	Grant/Sunset	East of Brentwood	12	26	57	122	263
15	Havenwood Ave.	West of Brentwood	1	3	6	13	28
16	Havenwood Ave.	East of Brentwood	5	11	23	50	108
17	Applewood Common	West of Brentwood	3	7	14	31	66
18	Applewood Common	East of Brentwood	3	6	13	29	62
19	Sand Creek Road	West of Brentwood	21	45	96	208	448
20	Sand Creek Road	East of Brentwood	9	19	41	88	189
21	Technology Way	West of Brentwood	4	8	17	36	78
22	Nancy Street	West of Brentwood	3	7	15	31	68
23	Nancy Street	East of Brentwood	4	8	17	37	79
24	Village Drive	East of Brentwood	3	5	12	25	54

Appendix 4.4-E

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline + Project Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Central/Sycamore	West of Brentwood	8,550	83		17	2	1	40	100	
2	Central/Sycamore	East of Brentwood	7,410	83		17	2	1	40	100	
3	Second Street	South of Central	8,790	83		17	2	1	40	100	
4	Central Blvd.	West of Second	10,270	83		17	2	1	40	100	
5	Central Blvd.	East of Second	10,100	83		17	2	1	40	100	
6	Central Blvd.	West of Walnut	11,320	83		17	2	1	40	100	
7	Central Blvd.	East of Walnut	14,630	83		17	2	1	40	100	
8	Walnut Blvd.	South of Central	4,780	83		17	2	1	40	100	
9	Pine Street	East of Brentwood	700	83		17	2	1	30	100	
10	Maple Street	West of Brentwood	0	83			2	1	30	100	
11	Maple Street	East of Brentwood	900	83		17	2	1	30	100	
12	Oak Street	West of Brentwood	12,160	83		17	2	1	30	100	
13	Oak Street	East of Brentwood	5,970	83		17	2	1	30	100	
14	Second Street	West of Brentwood	8,400	83		17	2	1	40	100	
15	Second Street	East of Brentwood	8,730	83		17	2	1	30	100	
16	Chestnut Street	East of Brentwood	1,190	83		17	2	1	30	100	
17	Balfour Road	West of Brentwood	24,040	83		17	2	1	40	100	
18	Balfour Road	East of Brentwood	14,130	83		17	2	1	40	100	
19	Sellers Ave.	North of Sunset	6,080	83		17	2	1	40	100	
20	Sellers Ave.	South of Sunset	2,810	83		17	2	1	40	100	
21	Sunset Road	West of Sellers	3,900	83		17	2	1	40	100	
22	Sunset Road	East of Sellers	2,400	83		17	2	1	40	100	

Appendix 4.4-E

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline + Project Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Central/Sycamore	West of Brentwood	59.6	51.7	53.5	61.1
2	Central/Sycamore	East of Brentwood	59.0	51.1	52.9	60.5
3	Second Street	South of Central	59.8	51.8	53.6	61.2
4	Central Blvd.	West of Second	60.4	52.5	54.3	61.9
5	Central Blvd.	East of Second	60.4	52.4	54.3	61.8
6	Central Blvd.	West of Walnut	60.9	52.9	54.7	62.3
7	Central Blvd.	East of Walnut	62.0	54.0	55.9	63.5
8	Walnut Blvd.	South of Central	57.1	49.2	51.0	58.6
9	Pine Street	East of Brentwood	45.2	38.9	43.0	47.8
11	Maple Street	East of Brentwood	46.3	40.0	44.1	48.9
12	Oak Street	West of Brentwood	57.6	51.3	55.4	60.2
13	Oak Street	East of Brentwood	54.5	48.2	52.3	57.1
14	Second Street	West of Brentwood	59.6	51.6	53.5	61.0
15	Second Street	East of Brentwood	56.1	49.9	54.0	58.8
16	Chestnut Street	East of Brentwood	47.5	41.2	45.3	50.1
17	Balfour Road	West of Brentwood	64.1	56.2	58.0	65.6
18	Balfour Road	East of Brentwood	61.8	53.9	55.7	63.3
19	Sellers Ave.	North of Sunset	58.2	50.2	52.0	59.6
20	Sellers Ave.	South of Sunset	54.8	46.9	48.7	56.3
21	Sunset Road	West of Sellers	56.2	48.3	50.1	57.7
22	Sunset Road	East of Sellers	54.1	46.2	48.0	55.6

Appendix 4.4-E

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Baseline + Project Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Central/Sycamore	West of Brentwood	12	26	55	119	256
2	Central/Sycamore	East of Brentwood	11	23	50	108	233
3	Second Street	South of Central	12	26	56	121	261
4	Central Blvd.	West of Second	13	29	62	134	289
5	Central Blvd.	East of Second	13	29	62	133	286
6	Central Blvd.	West of Walnut	14	31	67	143	309
7	Central Blvd.	East of Walnut	17	37	79	170	366
8	Walnut Blvd.	South of Central	8	17	37	81	174
9	Pine Street	East of Brentwood	2	3	7	15	33
11	Maple Street	East of Brentwood	2	4	8	18	39
12	Oak Street	West of Brentwood	10	22	48	104	223
13	Oak Street	East of Brentwood	6	14	30	64	139
14	Second Street	West of Brentwood	12	25	55	117	253
15	Second Street	East of Brentwood	8	18	39	83	179
16	Chestnut Street	East of Brentwood	2	5	10	22	47
17	Balfour Road	West of Brentwood	24	51	110	237	510
18	Balfour Road	East of Brentwood	17	36	77	166	358
19	Sellers Ave.	North of Sunset	9	20	44	95	204
20	Sellers Ave.	South of Sunset	6	12	26	57	122
21	Sunset Road	West of Sellers	7	15	33	70	152
22	Sunset Road	East of Sellers	5	11	24	51	110

Appendix 4.4-F

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Brentwood Blvd.	North of Delta	19,900	83		17	2	3	40	100	
2	Brentwood Blvd.	Delta to Sims	21,829	83		17	2	3	40	100	
3	Brentwood Blvd.	Sims to Lone Tree	23,986	83		17	2	3	40	100	
4	Brentwood Blvd.	Lone Tree to Sunrise	39,524	83		17	2	3	40	100	
5	Brentwood Blvd.	Sunrise to Gregory	42,309	83		17	2	3	40	100	
6	Brentwood Blvd.	Gregory to Hanson	41,833	83		17	2	3	40	100	
7	Brentwood Blvd.	Hanson to Homecoming	43,045	83		17	2	3	40	100	
8	Brentwood Blvd.	Homecoming to Grant	43,968	83		17	2	3	40	100	
9	Brentwood Blvd.	Grant to Sunset	39,206	83		17	2	3	40	100	
10	Brentwood Blvd.	Sunset to Havenwood	37,042	83		17	2	3	40	100	
11	Brentwood Blvd.	Havenwood to Applewood	40,361	83		17	2	3	40	75	
12	Brentwood Blvd.	Applewood to Sand Creek	40,996	83		17	2	3	40	75	
13	Brentwood Blvd.	Sand Creek to Technology	41,068	83		17	2	3	40	75	
14	Brentwood Blvd.	Technology to Nancy	40,317	83		17	2	3	40	75	
15	Brentwood Blvd.	Nancy to Village	37,662	83		17	2	3	40	75	
16	Brentwood Blvd.	Village to Central / Sycamore	36,364	83		17	2	3	40	75	
17	Brentwood Blvd.	Central / Sycamore to Spruce	24,743	83		17	2	3	40	75	
18	Brentwood Blvd.	Pine to Maple	6,733	83		17	2	3	40	75	
19	Brentwood Blvd.	Maple to Oak	7,844	83		17	2	3	40	75	
20	Brentwood Blvd.	Oak to Second	5,822	83		17	2	3	40	75	
21	Brentwood Blvd.	Second to Chestnut	7,726	83		17	2	3	40	75	
22	Brentwood Blvd.	Chestnut to Balfour	6,853	83		17	2	3	40	75	
23	Brentwood Blvd.	Balfour to Sunset	10,280	83		17	2	3	40	75	

Appendix 4.4-F

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Brentwood Blvd.	North of Delta	63.2	55.4	62.0	66.0
2	Brentwood Blvd.	Delta to Sims	63.6	55.8	62.4	66.4
3	Brentwood Blvd.	Sims to Lone Tree	64.0	56.2	62.8	66.9
4	Brentwood Blvd.	Lone Tree to Sunrise	66.2	58.4	64.9	69.0
5	Brentwood Blvd.	Sunrise to Gregory	66.5	58.7	65.2	69.3
6	Brentwood Blvd.	Gregory to Hanson	66.5	58.6	65.2	69.3
7	Brentwood Blvd.	Hanson to Homecoming	66.6	58.7	65.3	69.4
8	Brentwood Blvd.	Homecoming to Grant	66.7	58.8	65.4	69.5
9	Brentwood Blvd.	Grant to Sunset	66.2	58.3	64.9	69.0
10	Brentwood Blvd.	Sunset to Havenwood	65.9	58.1	64.7	68.7
11	Brentwood Blvd.	Havenwood to Applewood	68.2	60.3	66.9	71.0
12	Brentwood Blvd.	Applewood to Sand Creek	68.2	60.4	67.0	71.1
13	Brentwood Blvd.	Sand Creek to Technology	68.2	60.4	67.0	71.1
14	Brentwood Blvd.	Technology to Nancy	68.2	60.3	66.9	71.0
15	Brentwood Blvd.	Nancy to Village	67.9	60.0	66.6	70.7
16	Brentwood Blvd.	Village to Central / Sycamore	67.7	59.9	66.5	70.5
17	Brentwood Blvd.	Central / Sycamore to Spruce	66.0	58.2	64.8	68.9
18	Brentwood Blvd.	Pine to Maple	60.4	52.6	59.1	63.2
19	Brentwood Blvd.	Maple to Oak	61.1	53.2	59.8	63.9
20	Brentwood Blvd.	Oak to Second	59.8	51.9	58.5	62.6
21	Brentwood Blvd.	Second to Chestnut	61.0	53.1	59.7	63.8
22	Brentwood Blvd.	Chestnut to Balfour	60.5	52.6	59.2	63.3
23	Brentwood Blvd.	Balfour to Sunset	62.2	54.4	61.0	65.0

Appendix 4.4-F

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Brentwood Blvd.	North of Delta	25	54	117	253	545
2	Brentwood Blvd.	Delta to Sims	27	58	125	269	579
3	Brentwood Blvd.	Sims to Lone Tree	29	62	133	286	617
4	Brentwood Blvd.	Lone Tree to Sunrise	40	86	185	400	861
5	Brentwood Blvd.	Sunrise to Gregory	42	90	194	418	901
6	Brentwood Blvd.	Gregory to Hanson	41	89	193	415	894
7	Brentwood Blvd.	Hanson to Homecoming	42	91	196	423	911
8	Brentwood Blvd.	Homecoming to Grant	43	92	199	429	924
9	Brentwood Blvd.	Grant to Sunset	40	86	184	397	856
10	Brentwood Blvd.	Sunset to Havenwood	38	82	178	383	824
11	Brentwood Blvd.	Havenwood to Applewood	41	87	188	405	873
12	Brentwood Blvd.	Applewood to Sand Creek	41	88	190	409	882
13	Brentwood Blvd.	Sand Creek to Technology	41	88	190	410	883
14	Brentwood Blvd.	Technology to Nancy	40	87	188	405	872
15	Brentwood Blvd.	Nancy to Village	39	83	180	387	833
16	Brentwood Blvd.	Village to Central / Sycamore	38	81	175	378	814
17	Brentwood Blvd.	Central / Sycamore to Spruce	29	63	136	292	630
18	Brentwood Blvd.	Pine to Maple	12	26	57	123	265
19	Brentwood Blvd.	Maple to Oak	14	29	63	136	293
20	Brentwood Blvd.	Oak to Second	11	24	52	111	240
21	Brentwood Blvd.	Second to Chestnut	13	29	62	135	290
22	Brentwood Blvd.	Chestnut to Balfour	12	27	58	124	268
23	Brentwood Blvd.	Balfour to Sunset	16	35	76	163	351

Appendix 4.4-F

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Delta Road	West of Brentwood	5,770	83		17	2	1	25	100	
2	Delta Road	East of Brentwood	9,200	83		17	2	1	40	100	
3	Delta Road	West of Sellers	7,640	83		17	2	1	40	100	
4	Delta Road	East of Sellers	5,680	83		17	2	1	40	100	
5	Sellers Ave.	North of Brentwood	4,970	83		17	2	1	40	100	
6	Sellers Ave.	South of Brentwood	6,890	83		17	2	1	40	100	
7	Lone Tree Way	West of Brentwood	24,330	83		17	2	1	40	100	
8	Lone Tree Way	East of Brentwood	2,660	83		17	2	1	40	100	
9	Sunrse Drive	West of Brentwood	1,970	83		17	2	1	30	100	
10	Gregory Lane	West of Brentwood	2,220	83		17	2	1	30	100	
11	Hanson Lane	East of Brentwood	2,650	83		17	2	1	35	100	
12	Homecoming Way	East of Brentwood	510	83		17	2	1	25	100	
13	Grant/Sunset	West of Brentwood	2,460	83		17	2	1	40	100	
14	Grant/Sunset	East of Brentwood	7,340	83		17	2	1	40	100	
15	Havenwood Ave.	West of Brentwood	270	83		17	2	1	25	100	
16	Havenwood Ave.	East of Brentwood	1,020	83		17	2	1	30	100	
17	Applewood Common	West of Brentwood	600	83		17	2	1	25	100	
18	Applewood Common	East of Brentwood	1,920	83		17	2	1	25	100	
19	Sand Creek Road	West of Brentwood	9,750	83		17	2	1	40	100	
20	Sand Creek Road	East of Brentwood	6,020	83		17	2	1	40	100	
21	Technology Way	West of Brentwood	1,520	83		17	2	1	30	100	
22	Nancy Street	West of Brentwood	0	83			2	1	30	100	
23	Nancy Street	East of Brentwood	4,300	83		17	2	1	25	100	
24	Village Drive	East of Brentwood	1,900	83		17	2	1	25	100	

Appendix 4.4-F

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Delta Road	West of Brentwood	52.1	46.8	51.4	55.4
2	Delta Road	East of Brentwood	60.0	52.0	53.8	61.4
3	Delta Road	West of Sellers	59.2	51.2	53.0	60.6
4	Delta Road	East of Sellers	57.9	49.9	51.8	59.3
5	Sellers Ave.	North of Brentwood	57.3	49.4	51.2	58.8
6	Sellers Ave.	South of Brentwood	58.7	50.8	52.6	60.2
7	Lone Tree Way	West of Brentwood	64.2	56.3	58.1	65.7
8	Lone Tree Way	East of Brentwood	54.6	46.6	48.5	56.1
9	Sunrse Drive	West of Brentwood	49.7	43.4	47.5	52.3
10	Gregory Lane	West of Brentwood	50.2	43.9	48.0	52.8
11	Hanson Lane	East of Brentwood	52.9	45.7	47.9	54.7
12	Homecoming Way	East of Brentwood	41.5	36.3	40.9	44.9
13	Grant/Sunset	West of Brentwood	54.2	46.3	48.1	55.7
14	Grant/Sunset	East of Brentwood	59.0	51.1	52.9	60.5
15	Havenwood Ave.	West of Brentwood	38.8	33.5	38.1	42.1
16	Havenwood Ave.	East of Brentwood	46.8	40.5	44.6	49.5
17	Applewood Common	West of Brentwood	42.2	37.0	41.6	45.6
18	Applewood Common	East of Brentwood	47.3	42.0	46.7	50.6
19	Sand Creek Road	West of Brentwood	60.2	52.3	54.1	61.7
20	Sand Creek Road	East of Brentwood	58.1	50.2	52.0	59.6
21	Technology Way	West of Brentwood	48.5	42.3	46.4	51.2
23	Nancy Street	East of Brentwood	50.8	45.5	50.2	54.1
24	Village Drive	East of Brentwood	47.2	42.0	46.6	50.6

Appendix 4.4-F

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Delta Road	West of Brentwood	5	11	23	49	107
2	Delta Road	East of Brentwood	12	27	58	125	269
3	Delta Road	West of Sellers	11	24	51	110	238
4	Delta Road	East of Sellers	9	19	42	90	195
5	Sellers Ave.	North of Brentwood	8	18	38	83	178
6	Sellers Ave.	South of Brentwood	10	22	48	103	222
7	Lone Tree Way	West of Brentwood	24	51	111	239	514
8	Lone Tree Way	East of Brentwood	5	12	25	55	118
9	Sunrse Drive	West of Brentwood	3	7	14	31	66
10	Gregory Lane	West of Brentwood	3	7	15	33	72
11	Hanson Lane	East of Brentwood	4	10	21	44	95
12	Homecoming Way	East of Brentwood	1	2	5	10	21
13	Grant/Sunset	West of Brentwood	5	11	24	52	112
14	Grant/Sunset	East of Brentwood	11	23	50	107	231
15	Havenwood Ave.	West of Brentwood	1	1	3	6	14
16	Havenwood Ave.	East of Brentwood	2	4	9	20	43
17	Applewood Common	West of Brentwood	1	2	5	11	24
18	Applewood Common	East of Brentwood	2	5	11	24	51
19	Sand Creek Road	West of Brentwood	13	28	60	130	279
20	Sand Creek Road	East of Brentwood	9	20	44	94	203
21	Technology Way	West of Brentwood	3	6	12	26	56
23	Nancy Street	East of Brentwood	4	9	19	41	88
24	Village Drive	East of Brentwood	2	5	11	24	51

Appendix 4.4-F

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Central/Sycamore	West of Brentwood	7,850	83		17	2	1	40	100	
2	Central/Sycamore	East of Brentwood	5,130	83		17	2	1	40	100	
3	Second Street	South of Central	10,610	83		17	2	1	40	100	
4	Central Blvd.	West of Second	15,850	83		17	2	1	40	100	
5	Central Blvd.	East of Second	17,340	83		17	2	1	40	100	
6	Central Blvd.	West of Walnut	15,570	83		17	2	1	40	100	
7	Central Blvd.	East of Walnut	20,510	83		17	2	1	40	100	
8	Walnut Blvd.	South of Central	11,930	83		17	2	1	40	100	
9	Pine Street	East of Brentwood	290	83		17	2	1	30	100	
10	Maple Street	West of Brentwood	2,530	83		17	2	1	30	100	
11	Maple Street	East of Brentwood	1,380	83		17	2	1	30	100	
12	Oak Street	West of Brentwood	4,980	83		17	2	1	30	100	
13	Oak Street	East of Brentwood	3,710	83		17	2	1	30	100	
14	Second Street	West of Brentwood	6,500	83		17	2	1	40	100	
15	Second Street	East of Brentwood	7,940	83		17	2	1	30	100	
16	Chestnut Street	East of Brentwood	580	83		17	2	1	30	100	
17	Balfour Road	West of Brentwood	14,930	83		17	2	1	40	100	
18	Balfour Road	East of Brentwood	8,610	83		17	2	1	40	100	
19	Sellers Ave.	North of Sunset	7,850	83		17	2	1	40	100	
20	Sellers Ave.	South of Sunset	4,010	83		17	2	1	40	100	
21	Sunset Road	West of Sellers	5,200	83		17	2	1	40	100	
22	Sunset Road	East of Sellers	3,260	83		17	2	1	40	100	

Appendix 4.4-F

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

Predicted Levels

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Central/Sycamore	West of Brentwood	59.3	51.3	53.2	60.8
2	Central/Sycamore	East of Brentwood	57.4	49.5	51.3	58.9
3	Second Street	South of Central	60.6	52.7	54.5	62.1
4	Central Blvd.	West of Second	62.3	54.4	56.2	63.8
5	Central Blvd.	East of Second	62.7	54.8	56.6	64.2
6	Central Blvd.	West of Walnut	62.3	54.3	56.1	63.7
7	Central Blvd.	East of Walnut	63.4	55.5	57.3	64.9
8	Walnut Blvd.	South of Central	61.1	53.2	55.0	62.6
9	Pine Street	East of Brentwood	41.4	35.1	39.2	44.0
10	Maple Street	West of Brentwood	50.8	44.5	48.6	53.4
11	Maple Street	East of Brentwood	48.1	41.8	46.0	50.8
12	Oak Street	West of Brentwood	53.7	47.4	51.5	56.4
13	Oak Street	East of Brentwood	52.4	46.1	50.3	55.1
14	Second Street	West of Brentwood	58.5	50.5	52.3	59.9
15	Second Street	East of Brentwood	55.7	49.4	53.6	58.4
16	Chestnut Street	East of Brentwood	44.4	38.1	42.2	47.0
17	Balfour Road	West of Brentwood	62.1	54.1	55.9	63.5
18	Balfour Road	East of Brentwood	59.7	51.7	53.6	61.2
19	Sellers Ave.	North of Sunset	59.3	51.3	53.2	60.8
20	Sellers Ave.	South of Sunset	56.4	48.4	50.2	57.8
21	Sunset Road	West of Sellers	57.5	49.6	51.4	59.0
22	Sunset Road	East of Sellers	55.5	47.5	49.3	56.9

Appendix 4.4-F

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Central/Sycamore	West of Brentwood	11	24	52	112	242
2	Central/Sycamore	East of Brentwood	8	18	39	85	182
3	Second Street	South of Central	14	30	64	137	296
4	Central Blvd.	West of Second	18	39	83	179	386
5	Central Blvd.	East of Second	19	41	88	190	410
6	Central Blvd.	West of Walnut	18	38	82	177	382
7	Central Blvd.	East of Walnut	21	46	99	213	459
8	Walnut Blvd.	South of Central	15	32	69	148	320
9	Pine Street	East of Brentwood	1	2	4	9	18
10	Maple Street	West of Brentwood	4	8	17	36	78
11	Maple Street	East of Brentwood	2	5	11	24	52
12	Oak Street	West of Brentwood	6	12	27	57	123
13	Oak Street	East of Brentwood	5	10	22	47	101
14	Second Street	West of Brentwood	10	21	46	99	213
15	Second Street	East of Brentwood	8	17	36	78	168
16	Chestnut Street	East of Brentwood	1	3	6	14	29
17	Balfour Road	West of Brentwood	17	37	80	172	371
18	Balfour Road	East of Brentwood	12	26	55	119	257
19	Sellers Ave.	North of Sunset	11	24	52	112	242
20	Sellers Ave.	South of Sunset	7	15	33	72	155
21	Sunset Road	West of Sellers	9	18	40	85	184
22	Sunset Road	East of Sellers	6	13	29	62	135

Appendix 4.4-G

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 + Project Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Brentwood Blvd.	North of Delta	19,086	83		17	2	3	40	100	
2	Brentwood Blvd.	Delta to Sims	21,057	83		17	2	3	40	100	
3	Brentwood Blvd.	Sims to Lone Tree	23,857	83		17	2	3	40	100	
4	Brentwood Blvd.	Lone Tree to Sunrise	37,229	83		17	2	3	40	100	
5	Brentwood Blvd.	Sunrise to Gregory	39,582	83		17	2	3	40	100	
6	Brentwood Blvd.	Gregory to Hanson	39,062	83		17	2	3	40	100	
7	Brentwood Blvd.	Hanson to Homecoming	40,519	83		17	2	3	40	100	
8	Brentwood Blvd.	Homecoming to Grant	40,303	83		17	2	3	40	100	
9	Brentwood Blvd.	Grant to Sunset	36,277	83		17	2	3	40	100	
10	Brentwood Blvd.	Sunset to Havenwood	33,694	83		17	2	3	40	100	
11	Brentwood Blvd.	Havenwood to Applewood	36,046	83		17	2	3	40	75	
12	Brentwood Blvd.	Applewood to Sand Creek	36,537	83		17	2	3	40	75	
13	Brentwood Blvd.	Sand Creek to Technology	37,532	83		17	2	3	40	75	
14	Brentwood Blvd.	Technology to Nancy	37,186	83		17	2	3	40	75	
15	Brentwood Blvd.	Nancy to Village	35,714	83		17	2	3	40	75	
16	Brentwood Blvd.	Village to Central / Sycamore	34,113	83		17	2	3	40	75	
17	Brentwood Blvd.	Central / Sycamore to Spruce	23,157	83		17	2	3	40	75	
18	Brentwood Blvd.	Pine to Maple	6,444	83		17	2	3	40	75	
19	Brentwood Blvd.	Maple to Oak	7,444	83		17	2	3	40	75	
20	Brentwood Blvd.	Oak to Second	5,533	83		17	2	3	40	75	
21	Brentwood Blvd.	Second to Chestnut	7,284	83		17	2	3	40	75	
22	Brentwood Blvd.	Chestnut to Balfour	6,390	83		17	2	3	40	75	
23	Brentwood Blvd.	Balfour to Sunset	10,194	83		17	2	3	40	75	

Appendix 4.4-G

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 + Project Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Brentwood Blvd.	North of Delta	63.0	55.2	61.8	65.9
2	Brentwood Blvd.	Delta to Sims	63.5	55.6	62.2	66.3
3	Brentwood Blvd.	Sims to Lone Tree	64.0	56.2	62.8	66.8
4	Brentwood Blvd.	Lone Tree to Sunrise	65.9	58.1	64.7	68.8
5	Brentwood Blvd.	Sunrise to Gregory	66.2	58.4	65.0	69.0
6	Brentwood Blvd.	Gregory to Hanson	66.2	58.3	64.9	69.0
7	Brentwood Blvd.	Hanson to Homecoming	66.3	58.5	65.1	69.1
8	Brentwood Blvd.	Homecoming to Grant	66.3	58.4	65.0	69.1
9	Brentwood Blvd.	Grant to Sunset	65.8	58.0	64.6	68.7
10	Brentwood Blvd.	Sunset to Havenwood	65.5	57.7	64.3	68.3
11	Brentwood Blvd.	Havenwood to Applewood	67.7	59.8	66.4	70.5
12	Brentwood Blvd.	Applewood to Sand Creek	67.7	59.9	66.5	70.6
13	Brentwood Blvd.	Sand Creek to Technology	67.9	60.0	66.6	70.7
14	Brentwood Blvd.	Technology to Nancy	67.8	60.0	66.6	70.6
15	Brentwood Blvd.	Nancy to Village	67.6	59.8	66.4	70.5
16	Brentwood Blvd.	Village to Central / Sycamore	67.4	59.6	66.2	70.3
17	Brentwood Blvd.	Central / Sycamore to Spruce	65.8	57.9	64.5	68.6
18	Brentwood Blvd.	Pine to Maple	60.2	52.4	58.9	63.0
19	Brentwood Blvd.	Maple to Oak	60.8	53.0	59.6	63.6
20	Brentwood Blvd.	Oak to Second	59.5	51.7	58.3	62.4
21	Brentwood Blvd.	Second to Chestnut	60.7	52.9	59.5	63.6
22	Brentwood Blvd.	Chestnut to Balfour	60.2	52.3	58.9	63.0
23	Brentwood Blvd.	Balfour to Sunset	62.2	54.4	60.9	65.0

Appendix 4.4-G

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 + Project Traffic (Page 1 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Brentwood Blvd.	North of Delta	25	53	114	246	530
2	Brentwood Blvd.	Delta to Sims	26	57	122	263	566
3	Brentwood Blvd.	Sims to Lone Tree	29	61	132	285	615
4	Brentwood Blvd.	Lone Tree to Sunrise	38	83	178	384	827
5	Brentwood Blvd.	Sunrise to Gregory	40	86	186	400	862
6	Brentwood Blvd.	Gregory to Hanson	40	85	184	396	854
7	Brentwood Blvd.	Hanson to Homecoming	41	88	189	406	875
8	Brentwood Blvd.	Homecoming to Grant	40	87	188	405	872
9	Brentwood Blvd.	Grant to Sunset	38	81	175	377	813
10	Brentwood Blvd.	Sunset to Havenwood	36	77	167	359	774
11	Brentwood Blvd.	Havenwood to Applewood	38	81	174	376	809
12	Brentwood Blvd.	Applewood to Sand Creek	38	82	176	379	817
13	Brentwood Blvd.	Sand Creek to Technology	39	83	179	386	832
14	Brentwood Blvd.	Technology to Nancy	38	83	178	384	826
15	Brentwood Blvd.	Nancy to Village	37	80	173	373	804
16	Brentwood Blvd.	Village to Central / Sycamore	36	78	168	362	780
17	Brentwood Blvd.	Central / Sycamore to Spruce	28	60	130	280	603
18	Brentwood Blvd.	Pine to Maple	12	26	55	119	257
19	Brentwood Blvd.	Maple to Oak	13	28	61	131	283
20	Brentwood Blvd.	Oak to Second	11	23	50	108	232
21	Brentwood Blvd.	Second to Chestnut	13	28	60	129	279
22	Brentwood Blvd.	Chestnut to Balfour	12	26	55	119	255
23	Brentwood Blvd.	Balfour to Sunset	16	35	75	162	349

Appendix 4.4-G

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 + Project Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Delta Road	West of Brentwood	5,640	83		17	2	1	25	100	
2	Delta Road	East of Brentwood	8,500	83		17	2	1	40	100	
3	Delta Road	West of Sellers	7,370	83		17	2	1	40	100	
4	Delta Road	East of Sellers	5,190	83		17	2	1	40	100	
5	Sellers Ave.	North of Brentwood	4,240	83		17	2	1	40	100	
6	Sellers Ave.	South of Brentwood	6,200	83		17	2	1	40	100	
7	Lone Tree Way	West of Brentwood	23,320	83		17	2	1	40	100	
8	Lone Tree Way	East of Brentwood	2,530	83		17	2	1	40	100	
9	Sunrse Drive	West of Brentwood	1,200	83		17	2	1	30	100	
10	Gregory Lane	West of Brentwood	1,470	83		17	2	1	30	100	
11	Hanson Lane	East of Brentwood	1,340	83		17	2	1	35	100	
12	Homecoming Way	East of Brentwood	350	83		17	2	1	25	100	
13	Grant/Sunset	West of Brentwood	2,160	83		17	2	1	40	100	
14	Grant/Sunset	East of Brentwood	6,130	83		17	2	1	40	100	
15	Havenwood Ave.	West of Brentwood	250	83		17	2	1	25	100	
16	Havenwood Ave.	East of Brentwood	880	83		17	2	1	30	100	
17	Applewood Common	West of Brentwood	530	83		17	2	1	25	100	
18	Applewood Common	East of Brentwood	1,640	83		17	2	1	25	100	
19	Sand Creek Road	West of Brentwood	8,910	83		17	2	1	40	100	
20	Sand Creek Road	East of Brentwood	5,910	83		17	2	1	40	100	
21	Technology Way	West of Brentwood	1,400	83		17	2	1	30	100	
22	Nancy Street	West of Brentwood	2,030	83		17	2	1	30	100	
23	Nancy Street	East of Brentwood	4,240	83		17	2	1	25	100	
24	Village Drive	East of Brentwood	1,860	83		17	2	1	25	100	

Appendix 4.4-G

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 + Project Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Delta Road	West of Brentwood	52.0	46.7	51.3	55.3
2	Delta Road	East of Brentwood	59.6	51.7	53.5	61.1
3	Delta Road	West of Sellers	59.0	51.1	52.9	60.5
4	Delta Road	East of Sellers	57.5	49.5	51.4	59.0
5	Sellers Ave.	North of Brentwood	56.6	48.7	50.5	58.1
6	Sellers Ave.	South of Brentwood	58.3	50.3	52.1	59.7
7	Lone Tree Way	West of Brentwood	64.0	56.1	57.9	65.5
8	Lone Tree Way	East of Brentwood	54.4	46.4	48.2	55.8
9	Sunrse Drive	West of Brentwood	47.5	41.2	45.4	50.2
10	Gregory Lane	West of Brentwood	48.4	42.1	46.2	51.1
11	Hanson Lane	East of Brentwood	49.9	42.8	44.9	51.7
12	Homecoming Way	East of Brentwood	39.9	34.7	39.3	43.2
13	Grant/Sunset	West of Brentwood	53.7	45.7	47.6	55.2
14	Grant/Sunset	East of Brentwood	58.2	50.3	52.1	59.7
15	Havenwood Ave.	West of Brentwood	38.4	33.2	37.8	41.8
16	Havenwood Ave.	East of Brentwood	46.2	39.9	44.0	48.8
17	Applewood Common	West of Brentwood	41.7	36.5	41.1	45.0
18	Applewood Common	East of Brentwood	46.6	41.4	46.0	50.0
19	Sand Creek Road	West of Brentwood	59.8	51.9	53.7	61.3
20	Sand Creek Road	East of Brentwood	58.0	50.1	51.9	59.5
21	Technology Way	West of Brentwood	48.2	41.9	46.0	50.8
22	Nancy Street	West of Brentwood	49.8	43.5	47.6	52.5
23	Nancy Street	East of Brentwood	50.7	45.5	50.1	54.1
24	Village Drive	East of Brentwood	47.1	41.9	46.5	50.5

Appendix 4.4-G

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 + Project Traffic (Page 2 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Delta Road	West of Brentwood	5	11	23	49	105
2	Delta Road	East of Brentwood	12	26	55	118	255
3	Delta Road	West of Sellers	11	23	50	108	232
4	Delta Road	East of Sellers	9	18	40	85	184
5	Sellers Ave.	North of Brentwood	7	16	35	74	160
6	Sellers Ave.	South of Brentwood	10	21	45	96	207
7	Lone Tree Way	West of Brentwood	23	50	108	232	500
8	Lone Tree Way	East of Brentwood	5	11	24	53	114
9	Sunrse Drive	West of Brentwood	2	5	10	22	48
10	Gregory Lane	West of Brentwood	3	5	12	25	55
11	Hanson Lane	East of Brentwood	3	6	13	28	60
12	Homecoming Way	East of Brentwood	1	2	4	8	16
13	Grant/Sunset	West of Brentwood	5	10	22	47	102
14	Grant/Sunset	East of Brentwood	10	21	44	95	205
15	Havenwood Ave.	West of Brentwood	1	1	3	6	13
16	Havenwood Ave.	East of Brentwood	2	4	8	18	39
17	Applewood Common	West of Brentwood	1	2	5	10	22
18	Applewood Common	East of Brentwood	2	5	10	21	46
19	Sand Creek Road	West of Brentwood	12	26	57	122	263
20	Sand Creek Road	East of Brentwood	9	20	43	93	200
21	Technology Way	West of Brentwood	2	5	11	25	53
22	Nancy Street	West of Brentwood	3	7	15	31	68
23	Nancy Street	East of Brentwood	4	9	19	40	87
24	Village Drive	East of Brentwood	2	5	11	23	50

Appendix 4.4-G

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

Data Input Sheet

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 + Project Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Central/Sycamore	West of Brentwood	7,160	83		17	2	1	40	100	
2	Central/Sycamore	East of Brentwood	4,410	83		17	2	1	40	100	
3	Second Street	South of Central	10,190	83		17	2	1	40	100	
4	Central Blvd.	West of Second	14,870	83		17	2	1	40	100	
5	Central Blvd.	East of Second	16,260	83		17	2	1	40	100	
6	Central Blvd.	West of Walnut	14,930	83		17	2	1	40	100	
7	Central Blvd.	East of Walnut	19,780	83		17	2	1	40	100	
8	Walnut Blvd.	South of Central	11,550	83		17	2	1	40	100	
9	Pine Street	East of Brentwood	280	83		17	2	1	30	100	
10	Maple Street	West of Brentwood	2,440	83		17	2	1	30	100	
11	Maple Street	East of Brentwood	1,310	83		17	2	1	30	100	
12	Oak Street	West of Brentwood	4,870	83		17	2	1	30	100	
13	Oak Street	East of Brentwood	3,660	83		17	2	1	30	100	
14	Second Street	West of Brentwood	7,780	83		17	2	1	40	100	
15	Second Street	East of Brentwood	10,340	83		17	2	1	30	100	
16	Chestnut Street	East of Brentwood	530	83		17	2	1	30	100	
17	Balfour Road	West of Brentwood	14,980	83		17	2	1	40	100	
18	Balfour Road	East of Brentwood	8,560	83		17	2	1	40	100	
19	Sellers Ave.	North of Sunset	7,370	83		17	2	1	40	100	
20	Sellers Ave.	South of Sunset	3,770	83		17	2	1	40	100	
21	Sunset Road	West of Sellers	4,960	83		17	2	1	40	100	
22	Sunset Road	East of Sellers	3,170	83		17	2	1	40	100	

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consultants in acoustics

Appendix 4.4-G

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 + Project Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Central/Sycamore	West of Brentwood	58.9	50.9	52.8	60.4
2	Central/Sycamore	East of Brentwood	56.8	48.8	50.7	58.2
3	Second Street	South of Central	60.4	52.5	54.3	61.9
4	Central Blvd.	West of Second	62.1	54.1	55.9	63.5
5	Central Blvd.	East of Second	62.4	54.5	56.3	63.9
6	Central Blvd.	West of Walnut	62.1	54.1	55.9	63.5
7	Central Blvd.	East of Walnut	63.3	55.4	57.2	64.8
8	Walnut Blvd.	South of Central	61.0	53.0	54.8	62.4
9	Pine Street	East of Brentwood	41.2	34.9	39.0	43.9
10	Maple Street	West of Brentwood	50.6	44.3	48.4	53.3
11	Maple Street	East of Brentwood	47.9	41.6	45.7	50.6
12	Oak Street	West of Brentwood	53.6	47.3	51.4	56.3
13	Oak Street	East of Brentwood	52.4	46.1	50.2	55.0
14	Second Street	West of Brentwood	59.2	51.3	53.1	60.7
15	Second Street	East of Brentwood	56.9	50.6	54.7	59.5
16	Chestnut Street	East of Brentwood	44.0	37.7	41.8	46.6
17	Balfour Road	West of Brentwood	62.1	54.2	56.0	63.6
18	Balfour Road	East of Brentwood	59.7	51.7	53.5	61.1
19	Sellers Ave.	North of Sunset	59.0	51.1	52.9	60.5
20	Sellers Ave.	South of Sunset	56.1	48.2	50.0	57.6
21	Sunset Road	West of Sellers	57.3	49.3	51.2	58.8
22	Sunset Road	East of Sellers	55.3	47.4	49.2	56.8

Appendix 4.4-G

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

Project #: 2007-056 Brentwood Blvd. SP
Description: Cumulative 2030 + Project Traffic (Page 3 of 3)
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Central/Sycamore	West of Brentwood	11	23	49	106	227
2	Central/Sycamore	East of Brentwood	8	16	35	76	165
3	Second Street	South of Central	13	29	62	134	288
4	Central Blvd.	West of Second	17	37	80	172	370
5	Central Blvd.	East of Second	18	39	85	182	393
6	Central Blvd.	West of Walnut	17	37	80	172	371
7	Central Blvd.	East of Walnut	21	45	96	208	448
8	Walnut Blvd.	South of Central	15	31	67	145	313
9	Pine Street	East of Brentwood	1	2	4	8	18
10	Maple Street	West of Brentwood	4	8	16	36	77
11	Maple Street	East of Brentwood	2	5	11	23	51
12	Oak Street	West of Brentwood	6	12	26	56	121
13	Oak Street	East of Brentwood	5	10	22	47	100
14	Second Street	West of Brentwood	11	24	52	112	240
15	Second Street	East of Brentwood	9	20	43	93	200
16	Chestnut Street	East of Brentwood	1	3	6	13	28
17	Balfour Road	West of Brentwood	17	37	80	173	372
18	Balfour Road	East of Brentwood	12	26	55	119	256
19	Sellers Ave.	North of Sunset	11	23	50	108	232
20	Sellers Ave.	South of Sunset	7	15	32	69	148
21	Sunset Road	West of Sellers	8	18	38	83	178
22	Sunset Road	East of Sellers	6	13	28	61	132

APPENDIX H

URBEMIS Results
50% Buildout

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: I:\Projects\Active\Brentwood\Brentwood Blvd Specific Plan\Technical Reports\Air Quality\2011 Assessment\URBEMIS\BBSP (50% buildout 2020).urb924

Project Name: BBSP 2020

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	36.85	10.67	23.69	0.00	0.07	0.07	12,973.91

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	59.58	52.74	597.59	1.03	183.50	34.79	103,996.06

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	96.43	63.41	621.28	1.03	183.57	34.86	116,969.97

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.78	10.47	6.75	0.00	0.02	0.02	12,945.40
Hearth - No Summer Emissions							
Landscape	2.44	0.20	16.94	0.00	0.05	0.05	28.51
Consumer Products	24.27						
Architectural Coatings	9.36						
TOTALS (lbs/day, unmitigated)	36.85	10.67	23.69	0.00	0.07	0.07	12,973.91

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	9.23	8.34	98.11	0.17	30.04	5.70	17,069.13
Apartments high rise	6.79	5.55	65.32	0.11	20.00	3.79	11,364.66
Regnl shop. center	31.34	28.46	313.83	0.54	96.45	18.28	54,577.12
General office building	7.32	6.29	72.46	0.13	22.31	4.23	12,644.43
General light industry	4.90	4.10	47.87	0.08	14.70	2.79	8,340.72
TOTALS (lbs/day, unmitigated)	59.58	52.74	597.59	1.03	183.50	34.79	103,996.06

Operational Settings:

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Includes correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 0.00 Nonresidential Trip % Reduction: 0.00

Analysis Year: 2020 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	21.91	9.71	dwelling units	241.00	2,340.11	17,516.34
Apartments high rise	37.77	6.11	dwelling units	255.00	1,558.05	11,662.41
Regnl shop. center		34.55	1000 sq ft	344.80	11,912.84	56,233.73
General office building		9.61	1000 sq ft	208.65	2,005.13	13,005.35
General light industry		7.17	1000 sq ft	166.90	1,196.67	8,569.67
					19,012.80	106,987.50

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.0	0.0	100.0	0.0
Light Truck < 3750 lbs	12.6	0.0	98.4	1.6
Light Truck 3751-5750 lbs	19.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	40.6	59.4	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: I:\Projects\Active\Brentwood\Brentwood Blvd Specific Plan\Technical Reports\Air Quality\2011 Assessment\URBEMIS\BBSP (50% buildout 2020).urb924

Project Name: BBSP 2020

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	104.67	16.88	264.28	0.76	40.68	39.16	21,708.28

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	63.93	78.30	644.45	0.89	183.50	34.79	89,570.68

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	168.60	95.18	908.73	1.65	224.18	73.95	111,278.96

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.78	10.47	6.75	0.00	0.02	0.02	12,945.40
Hearth	70.26	6.41	257.53	0.76	40.66	39.14	8,762.88
Landscaping - No Winter Emissions							
Consumer Products	24.27						
Architectural Coatings	9.36						
TOTALS (lbs/day, unmitigated)	104.67	16.88	264.28	0.76	40.68	39.16	21,708.28

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	9.27	12.44	101.67	0.15	30.04	5.70	14,707.36
Apartments high rise	6.17	8.28	67.69	0.10	20.00	3.79	9,792.19
Regnl shop. center	36.71	42.10	349.54	0.46	96.45	18.28	46,994.99
General office building	7.22	9.37	76.10	0.11	22.31	4.23	10,890.89
General light industry	4.56	6.11	49.45	0.07	14.70	2.79	7,185.25
TOTALS (lbs/day, unmitigated)	63.93	78.30	644.45	0.89	183.50	34.79	89,570.68

Operational Settings:

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Includes correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 0.00 Nonresidential Trip % Reduction: 0.00

Analysis Year: 2020 Temperature (F): 40 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	21.91	9.71	dwelling units	241.00	2,340.11	17,516.34
Apartments high rise	37.77	6.11	dwelling units	255.00	1,558.05	11,662.41
Regnl shop. center		34.55	1000 sq ft	344.80	11,912.84	56,233.73
General office building		9.61	1000 sq ft	208.65	2,005.13	13,005.35
General light industry		7.17	1000 sq ft	166.90	1,196.67	8,569.67
					19,012.80	106,987.50

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.0	0.0	100.0	0.0
Light Truck < 3750 lbs	12.6	0.0	98.4	1.6
Light Truck 3751-5750 lbs	19.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	40.6	59.4	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: I:\Projects\Active\Brentwood\Brentwood Blvd Specific Plan\Technical Reports\Air Quality\2011 Assessment\URBEMIS\BBSP (50% buildout 2020).urb924

Project Name: BBSP 2020

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	9.38	2.12	13.28	0.03	1.66	1.60	2,627.45

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	11.14	11.18	111.91	0.17	33.48	6.35	18,101.74

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	20.52	13.30	125.19	0.20	35.14	7.95	20,729.19

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.14	1.91	1.23	0.00	0.00	0.00	2,362.54
Hearth	2.88	0.19	10.53	0.03	1.66	1.60	262.34
Landscape	0.22	0.02	1.52	0.00	0.00	0.00	2.57
Consumer Products	4.43						
Architectural Coatings	1.71						
TOTALS (tons/year, unmitigated)	9.38	2.12	13.28	0.03	1.66	1.60	2,627.45

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	1.69	1.77	18.12	0.03	5.48	1.04	2,971.44
Apartments high rise	1.20	1.18	12.07	0.02	3.65	0.69	1,978.39
Regnl shop. center	6.05	6.02	59.45	0.09	17.60	3.34	9,499.08
General office building	1.33	1.34	13.44	0.02	4.07	0.77	2,200.94
General light industry	0.87	0.87	8.83	0.01	2.68	0.51	1,451.89
TOTALS (tons/year, unmitigated)	11.14	11.18	111.91	0.17	33.48	6.35	18,101.74

Operational Settings:

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Includes correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 0.00 Nonresidential Trip % Reduction: 0.00

Analysis Year: 2020 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	21.91	9.71	dwelling units	241.00	2,340.11	17,516.34
Apartments high rise	37.77	6.11	dwelling units	255.00	1,558.05	11,662.41
Regnl shop. center		34.55	1000 sq ft	344.80	11,912.84	56,233.73
General office building		9.61	1000 sq ft	208.65	2,005.13	13,005.35
General light industry		7.17	1000 sq ft	166.90	1,196.67	8,569.67
					19,012.80	106,987.50

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.0	0.0	100.0	0.0
Light Truck < 3750 lbs	12.6	0.0	98.4	1.6
Light Truck 3751-5750 lbs	19.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	40.6	59.4	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

URBEMIS Results
100% Buildout

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: I:\Projects\Active\Brentwood\Brentwood Blvd Specific Plan\Technical Reports\Air Quality\2011 Assessment\URBEMIS\BBSP (full buildout 2030).urb924

Project Name: BBSP 2030

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	129.35	28.01	43.73	0.00	0.13	0.13	34,597.73

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	102.85	74.75	964.95	2.49	442.07	83.78	250,681.86

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	232.20	102.76	1,008.68	2.49	442.20	83.91	285,279.59

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	2.09	27.68	16.03	0.00	0.05	0.05	34,551.95
Hearth - No Summer Emissions							
Landscape	4.38	0.33	27.70	0.00	0.08	0.08	45.78
Consumer Products	97.45						
Architectural Coatings	25.43						
TOTALS (lbs/day, unmitigated)	129.35	28.01	43.73	0.00	0.13	0.13	34,597.73

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	12.52	9.35	124.16	0.32	56.74	10.76	32,242.35
Apartments high rise	28.34	19.52	259.17	0.67	118.45	22.45	67,302.07
Regnl shop. center	44.67	33.55	420.34	1.08	192.88	36.55	109,163.29
General office building	10.38	7.46	97.13	0.25	44.61	8.45	25,291.18
General light industry	6.94	4.87	64.15	0.17	29.39	5.57	16,682.97
TOTALS (lbs/day, unmitigated)	102.85	74.75	964.95	2.49	442.07	83.78	250,681.86

Operational Settings:

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Includes correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 0.00 Nonresidential Trip % Reduction: 0.00

Analysis Year: 2030 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	43.81	9.17	dwelling units	482.00	4,419.94	33,084.41
Apartments high rise	75.54	6.11	dwelling units	1,510.00	9,226.10	69,059.78
Regnl shop. center		34.55	1000 sq ft	689.60	23,825.68	112,467.46
General office building		9.61	1000 sq ft	417.30	4,010.25	26,010.70
General light industry		7.17	1000 sq ft	333.80	2,393.35	17,139.35
					43,875.32	257,761.70

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.1	0.0	100.0	0.0
Light Truck < 3750 lbs	12.5	0.0	99.2	0.8
Light Truck 3751-5750 lbs	19.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	34.4	65.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: I:\Projects\Active\Brentwood\Brentwood Blvd Specific Plan\Technical Reports\Air Quality\2011 Assessment\URBEMIS\BBSP (full buildout 2030).urb924

Project Name: BBSP 2030

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	407.09	52.69	1,049.99	3.05	163.28	157.17	68,801.61

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	107.22	110.85	1,025.27	2.15	442.07	83.78	215,599.95

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	514.31	163.54	2,075.26	5.20	605.35	240.95	284,401.56

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	2.09	27.68	16.03	0.00	0.05	0.05	34,551.95
Hearth	282.12	25.01	1,033.96	3.05	163.23	157.12	34,249.66
Landscaping - No Winter Emissions							
Consumer Products	97.45						
Architectural Coatings	25.43						
TOTALS (lbs/day, unmitigated)	407.09	52.69	1,049.99	3.05	163.28	157.17	68,801.61

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	12.58	13.92	128.40	0.28	56.74	10.76	27,739.49
Apartments high rise	26.27	29.06	268.02	0.58	118.45	22.45	57,902.89
Regnl shop. center	51.53	49.55	461.18	0.93	192.88	36.55	93,856.23
General office building	10.30	11.08	101.52	0.22	44.61	8.45	21,751.07
General light industry	6.54	7.24	66.15	0.14	29.39	5.57	14,350.27
TOTALS (lbs/day, unmitigated)	107.22	110.85	1,025.27	2.15	442.07	83.78	215,599.95

Operational Settings:

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Includes correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 0.00 Nonresidential Trip % Reduction: 0.00

Analysis Year: 2030 Temperature (F): 40 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	43.81	9.17	dwelling units	482.00	4,419.94	33,084.41
Apartments high rise	75.54	6.11	dwelling units	1,510.00	9,226.10	69,059.78
Regnl shop. center		34.55	1000 sq ft	689.60	23,825.68	112,467.46
General office building		9.61	1000 sq ft	417.30	4,010.25	26,010.70
General light industry		7.17	1000 sq ft	333.80	2,393.35	17,139.35
					43,875.32	257,761.70

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.1	0.0	100.0	0.0
Light Truck < 3750 lbs	12.5	0.0	99.2	0.8
Light Truck 3751-5750 lbs	19.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	34.4	65.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: I:\Projects\Active\Brentwood\Brentwood Blvd Specific Plan\Technical Reports\Air Quality\2011 Assessment\URBEMIS\BBSP (full buildout 2030).urb924

Project Name: BBSP 2030

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	34.75	5.83	47.70	0.12	6.69	6.44	7,362.98

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	19.04	15.83	179.78	0.44	80.68	15.29	43,615.28

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	53.79	21.66	227.48	0.56	87.37	21.73	50,978.26

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.38	5.05	2.93	0.00	0.01	0.01	6,305.73
Hearth	11.55	0.75	42.28	0.12	6.67	6.42	1,053.13
Landscape	0.39	0.03	2.49	0.00	0.01	0.01	4.12
Consumer Products	17.79						
Architectural Coatings	4.64						
TOTALS (tons/year, unmitigated)	34.75	5.83	47.70	0.12	6.69	6.44	7,362.98

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	2.29	1.98	22.92	0.06	10.36	1.96	5,610.30
Apartments high rise	5.05	4.14	47.84	0.12	21.62	4.10	11,710.84
Regnl shop. center	8.57	7.10	79.20	0.19	35.20	6.67	18,991.12
General office building	1.89	1.58	17.99	0.04	8.14	1.54	4,400.28
General light industry	1.24	1.03	11.83	0.03	5.36	1.02	2,902.74
TOTALS (tons/year, unmitigated)	19.04	15.83	179.78	0.44	80.68	15.29	43,615.28

Operational Settings:

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Includes correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 0.00 Nonresidential Trip % Reduction: 0.00

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	43.81	9.17	dwelling units	482.00	4,419.94	33,084.41
Apartments high rise	75.54	6.11	dwelling units	1,510.00	9,226.10	69,059.78
Regnl shop. center		34.55	1000 sq ft	689.60	23,825.68	112,467.46
General office building		9.61	1000 sq ft	417.30	4,010.25	26,010.70
General light industry		7.17	1000 sq ft	333.80	2,393.35	17,139.35
					43,875.32	257,761.70

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.1	0.0	100.0	0.0
Light Truck < 3750 lbs	12.5	0.0	99.2	0.8
Light Truck 3751-5750 lbs	19.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	34.4	65.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

URBEMIS Results
Baseline Conditions

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: I:\Projects\Active\Brentwood\Brentwood Blvd Specific Plan\Technical Reports\Air Quality\2011 Assessment\URBEMIS\BBSP Baseline_existing conditions.urb924

Project Name: BBSP Existing Conditions

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	6.23	1.60	9.14	0.02	1.15	1.11	1,976.03

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	21.14	24.82	223.97	0.17	33.91	6.49	18,367.45

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	27.37	26.42	233.11	0.19	35.06	7.60	20,343.48

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.11	1.46	1.02	0.00	0.00	0.00	1,793.25
Hearth	1.99	0.13	7.28	0.02	1.15	1.11	181.29
Landscape	0.08	0.01	0.84	0.00	0.00	0.00	1.49
Consumer Products	3.06						
Architectural Coatings	0.99						
TOTALS (tons/year, unmitigated)	6.23	1.60	9.14	0.02	1.15	1.11	1,976.03

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	0.45	0.55	5.10	0.00	0.79	0.15	427.64
Apartments low rise	1.54	1.83	16.90	0.01	2.61	0.50	1,418.32
Apartments high rise	1.12	1.28	11.81	0.01	1.82	0.35	990.94
Regnl shop. center	17.42	20.43	183.46	0.15	27.65	5.29	14,969.03
General office building	0.48	0.58	5.30	0.00	0.82	0.16	443.42
General light industry	0.13	0.15	1.40	0.00	0.22	0.04	118.10
TOTALS (tons/year, unmitigated)	21.14	24.82	223.97	0.17	33.91	6.49	18,367.45

Operational Settings:

10/11/2011 12:32:16 PM

Includes correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 0.00 Nonresidential Trip % Reduction: 0.00

Analysis Year: 2011 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	11.67	9.57	dwelling units	35.00	334.95	2,507.19
Apartments low rise	10.06	6.90	dwelling units	161.00	1,110.90	8,315.38
Apartments high rise	2.37	5.28	dwelling units	147.00	776.16	5,809.76
Regnl shop. center		42.94	1000 sq ft	434.70	18,666.02	88,111.64
General office building		11.01	1000 sq ft	36.49	401.75	2,605.80
General light industry		6.97	1000 sq ft	13.89	96.81	693.30
					21,386.59	108,043.07

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	53.8	0.9	98.7	0.4
Light Truck < 3750 lbs	12.8	1.6	95.3	3.1
Light Truck 3751-5750 lbs	19.8	0.5	99.5	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	62.5	37.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

Original CO Calculations

Existing

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.8	Background one-hour CO Concentration
1.8	Background eight-hour CO Concentration
4.242	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	738	89	-
1-hour local	0.44	0.01	0.45

	Intersection	Persistence Factor	ppm
8-hour local	0.45	0.70	0.32

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.45	1.80	**2.25**
8-hour total	0.32	1.80	**2.12**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.8	Background one-hour CO Concentration
1.8	Background eight-hour CO Concentration
4.242	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	837	44	-
1-hour local	0.50	0.01	0.50

	Intersection	Persistence Factor	ppm
8-hour local	0.50	0.70	0.35

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.50	1.80	**2.30**
8-hour total	0.35	1.80	**2.15**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.8	Background one-hour CO Concentration
1.8	Background eight-hour CO Concentration
4.242	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1012	10	-
1-hour local	0.60	0.00	0.60

	Intersection	Persistence Factor	ppm
8-hour local	0.60	0.70	0.42

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.60	1.80	**2.40**
8-hour total	0.42	1.80	**2.22**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.8	Background one-hour CO Concentration
1.8	Background eight-hour CO Concentration
4.242	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	999	30	-
1-hour local	0.59	0.00	0.60

	Intersection	Persistence Factor	ppm
8-hour local	0.60	0.70	0.42

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.60	1.80	**2.40**
8-hour total	0.42	1.80	**2.22**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.8	Background one-hour CO Concentration
1.8	Background eight-hour CO Concentration
4.242	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	878	25	-
1-hour local	0.52	0.00	0.53

	Intersection	Persistence Factor	ppm
8-hour local	0.53	0.70	0.37

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.53	1.80	**2.33**
8-hour total	0.37	1.80	**2.17**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.8	Background one-hour CO Concentration
1.8	Background eight-hour CO Concentration
4.242	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	739	19	-
1-hour local	0.44	0.00	0.44

	Intersection	Persistence Factor	ppm
8-hour local	0.44	0.70	0.31

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.44	1.80	**2.24**
8-hour total	0.31	1.80	**2.11**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.8	Background one-hour CO Concentration
1.8	Background eight-hour CO Concentration
4.242	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	999	16	-
1-hour local	0.59	0.00	0.60

	Intersection	Persistence Factor	ppm
8-hour local	0.60	0.70	0.42

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.60	1.80	**2.40**
8-hour total	0.42	1.80	**2.22**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.8	Background one-hour CO Concentration
1.8	Background eight-hour CO Concentration
4.242	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	708	19	-
1-hour local	0.42	0.00	0.42

	Intersection	Persistence Factor	ppm
8-hour local	0.42	0.70	0.30

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.42	1.80	**2.22**
8-hour total	0.30	1.80	**2.10**

Original CO Calculations

Near Term

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor (from EMFAC2007)
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	738	89	-
1-hour local	1.05	0.03	1.08

	Intersection	Persistence Factor	ppm
8-hour local	1.08	0.70	0.76

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	1.08	1.77	**2.85**
8-hour total	0.76	1.77	**2.53**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1481	375	-
1-hour local	2.11	0.14	2.25

	Intersection	Persistence Factor	ppm
8-hour local	2.25	0.70	1.58

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	2.25	1.77	**4.02**
8-hour total	1.58	1.77	**3.35**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1404	474	-
1-hour local	2.00	0.18	2.18

	Intersection	Persistence Factor	ppm
8-hour local	2.18	0.70	1.52

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	2.18	1.77	**3.95**
8-hour total	1.52	1.77	**3.29**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	473	423	-
1-hour local	0.67	0.16	0.83

	Intersection	Persistence Factor	ppm
8-hour local	0.83	0.70	0.58

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.83	1.77	**2.60**
8-hour total	0.58	1.77	**2.35**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2360	37	-
1-hour local	3.36	0.01	3.37

	Intersection	Persistence Factor	ppm
8-hour local	3.37	0.70	2.36

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	3.37	1.77	**5.14**
8-hour total	2.36	1.77	**4.13**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2322	53	-
1-hour local	3.31	0.02	3.33

	Intersection	Persistence Factor	ppm
8-hour local	3.33	0.70	2.33

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	3.33	1.77	**5.10**
8-hour total	2.33	1.77	**4.10**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2328	50	-
1-hour local	3.32	0.02	3.33

	Intersection	Persistence Factor	ppm
8-hour local	3.33	0.70	2.33

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	3.33	1.77	**5.10**
8-hour total	2.33	1.77	**4.10**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2392	38	-
1-hour local	3.41	0.01	3.42

	Intersection	Persistence Factor	ppm
8-hour local	3.42	0.70	2.39

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	3.42	1.77	**5.19**
8-hour total	2.39	1.77	**4.16**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2122	248	-
1-hour local	3.02	0.09	3.12

	Intersection	Persistence Factor	ppm
8-hour local	3.12	0.70	2.18

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	3.12	1.77	**4.89**
8-hour total	2.18	1.77	**3.95**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2429	40	-
1-hour local	3.46	0.02	3.47

	Intersection	Persistence Factor	ppm
8-hour local	3.47	0.70	2.43

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	3.47	1.77	**5.24**
8-hour total	2.43	1.77	**4.20**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2419	115	-
1-hour local	3.44	0.04	3.49

	Intersection	Persistence Factor	ppm
8-hour local	3.49	0.70	2.44

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	3.49	1.77	**5.26**
8-hour total	2.44	1.77	**4.21**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2424	90	-
1-hour local	3.45	0.03	3.49

	Intersection	Persistence Factor	ppm
8-hour local	3.49	0.70	2.44

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	3.49	1.77	**5.26**
8-hour total	2.44	1.77	**4.21**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1487	625	-
1-hour local	2.12	0.24	2.35

	Intersection	Persistence Factor	ppm
8-hour local	2.35	0.70	1.65

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	2.35	1.77	**4.12**
8-hour total	1.65	1.77	**3.42**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1746	66	-
1-hour local	2.49	0.02	2.51

	Intersection	Persistence Factor	ppm
8-hour local	2.51	0.70	1.76

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	2.51	1.77	**4.28**
8-hour total	1.76	1.77	**3.53**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1217	256	-
1-hour local	1.73	0.10	1.83

	Intersection	Persistence Factor	ppm
8-hour local	1.83	0.70	1.28

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	1.83	1.77	**3.60**
8-hour total	1.28	1.77	**3.05**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1345	59	-
1-hour local	1.92	0.02	1.94

	Intersection	Persistence Factor	ppm
8-hour local	1.94	0.70	1.36

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	1.94	1.77	**3.71**
8-hour total	1.36	1.77	**3.13**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1131	44	-
1-hour local	1.61	0.02	1.63

	Intersection	Persistence Factor	ppm
8-hour local	1.63	0.70	1.14

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	1.63	1.77	**3.40**
8-hour total	1.14	1.77	**2.91**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.77	Background one-hour CO Concentration
1.77	Background eight-hour CO Concentration
10.172	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	765	484	-
1-hour local	1.09	0.18	1.27

	Intersection	Persistence Factor	ppm
8-hour local	1.27	0.70	0.89

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	1.27	1.77	**3.04**
8-hour total	0.89	1.77	**2.66**

Original CO Calculations

Cumulative

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1349	429	-
1-hour local	0.34	0.03	0.37

	Intersection	Persistence Factor	ppm
8-hour local	0.37	0.70	0.26

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.37	1.74	**2.11**
8-hour total	0.26	1.74	**2.00**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1481	375	-
1-hour local	0.38	0.03	0.40

	Intersection	Persistence Factor	ppm
8-hour local	0.40	0.70	0.28

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.40	1.74	**2.14**
8-hour total	0.28	1.74	**2.02**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1404	474	-
1-hour local	0.36	0.03	0.39

	Intersection	Persistence Factor	ppm
8-hour local	0.39	0.70	0.27

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.39	1.74	**2.13**
8-hour total	0.27	1.74	**2.01**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	473	423	-
1-hour local	0.12	0.03	0.15

	Intersection	Persistence Factor	ppm
8-hour local	0.15	0.70	0.10

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.15	1.74	**1.89**
8-hour total	0.10	1.74	**1.84**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2360	37	-
1-hour local	0.60	0.00	0.61

	Intersection	Persistence Factor	ppm
8-hour local	0.61	0.70	0.42

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.61	1.74	**2.35**
8-hour total	0.42	1.74	**2.16**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2322	53	-
1-hour local	0.59	0.00	0.60

	Intersection	Persistence Factor	ppm
8-hour local	0.60	0.70	0.42

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.60	1.74	**2.34**
8-hour total	0.42	1.74	**2.16**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2328	50	-
1-hour local	0.59	0.00	0.60

	Intersection	Persistence Factor	ppm
8-hour local	0.60	0.70	0.42

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.60	1.74	**2.34**
8-hour total	0.42	1.74	**2.16**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2392	38	-
1-hour local	0.61	0.00	0.61

	Intersection	Persistence Factor	ppm
8-hour local	0.61	0.70	0.43

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.61	1.74	**2.35**
8-hour total	0.43	1.74	**2.17**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2122	199	-
1-hour local	0.54	0.01	0.56

	Intersection	Persistence Factor	ppm
8-hour local	0.56	0.70	0.39

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.56	1.74	**2.30**
8-hour total	0.39	1.74	**2.13**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2429	40	-
1-hour local	0.62	0.00	0.62

	Intersection	Persistence Factor	ppm
8-hour local	0.62	0.70	0.44

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.62	1.74	**2.36**
8-hour total	0.44	1.74	**2.18**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2419	115	-
1-hour local	0.62	0.01	0.63

	Intersection	Persistence Factor	ppm
8-hour local	0.63	0.70	0.44

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.63	1.74	**2.37**
8-hour total	0.44	1.74	**2.18**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	2424	90	-
1-hour local	0.62	0.01	0.63

	Intersection	Persistence Factor	ppm
8-hour local	0.63	0.70	0.44

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.63	1.74	**2.37**
8-hour total	0.44	1.74	**2.18**

Carbon Monoxide Calculator
Per BAAQMD Guidelines

Given:

1.74	Background one-hour CO Concentration
1.74	Background eight-hour CO Concentration
1.825	CO Emission Factor
14	Reference CO Concentration (Primary)
3.7	Reference CO Concentration (Secondary)

	Primary Road	Secondary Road	Total Concentration (ppm)
Hourly Traffic Volume	1746	66	-
1-hour local	0.45	0.00	0.45

	Intersection	Persistence Factor	ppm
8-hour local	0.45	0.70	0.32

Total CO Emissions

	Intersection	Background	Total ppm
1-hour total	0.45	1.74	**2.19**
8-hour total	0.32	1.74	**2.06**

BGM Results

Summary Results

Project Name: BBSP 2030

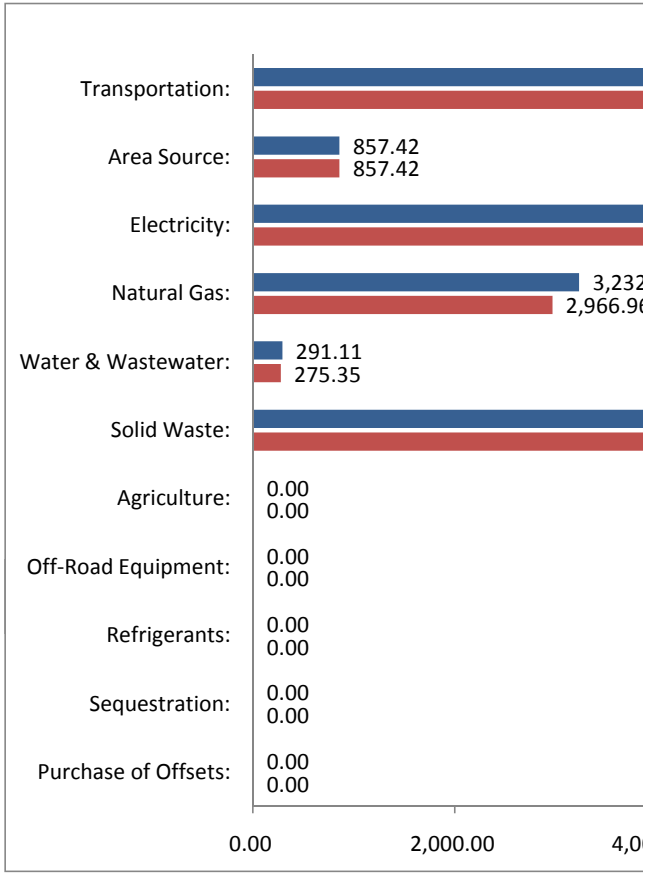
Project and Baseline Years: 2030 2011

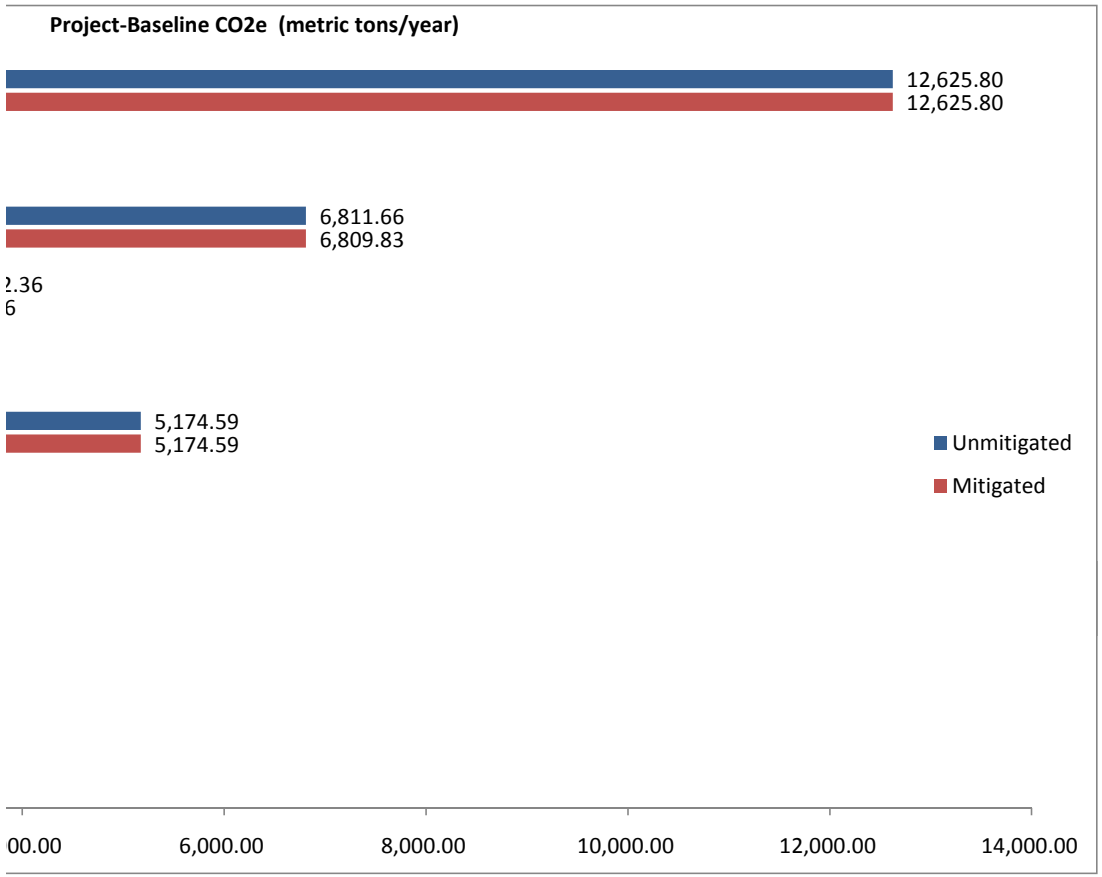
Results	Unmitigated Project-Baseline CO2e (metric tons/year)	Mitigated Project-Baseline CO2e (metric tons/year)
Transportation:	12,625.80	12,625.80
Area Source:	857.42	857.42
Electricity:	6,811.66	6,809.83
Natural Gas:	3,232.36	2,966.96
Water & Wastewater:	291.11	275.35
Solid Waste:	5,174.59	5,174.59
Agriculture:	0.00	0.00
Off-Road Equipment:	0.00	0.00
Refrigerants:	0.00	0.00
Sequestration:	N/A	0.00
Purchase of Offsets:	N/A	0.00
Total:	28,992.93	28,709.95

Baseline is currently: **ON**

Baseline Project Name: BBSP Existing Conditions

Go to Settings Tab to Turn Off Baseline




Project-Baseline CO2e (metric tons/year)
12,625.80
12,625.80
6,811.66
6,809.83
2.36
6
5,174.59
5,174.59
Unmitigated
Mitigated
00.00
6,000.00
8,000.00
10,000.00
12,000.00
14,000.00

Detailed Results

Unmitigated	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				29,915.04	57.82%
Area Source:	959.39	3.44	0.02	1,036.55	2.00%
Electricity:	9,541.55	0.08	0.04	9,556.82	18.47%
Natural Gas:	3,858.17	0.36	0.01	3,868.06	7.48%
Water & Wastewater:	362.51	0.00	0.00	363.09	0.70%
Solid Waste:	48.68	331.01	N/A	6,999.83	13.53%
Agriculture:	0.00	0.00	0.00	0.00	0.00%
Off-Road Equipment:	0.00	0.00	0.00	0.00	0.00%
Refrigerants:	N/A	N/A	N/A	0.00	0.00%
Sequestration:	N/A	N/A	N/A	N/A	N/A
Purchase of Offsets:	N/A	N/A	N/A	N/A	N/A
Total:				51,739.38	100.00%

* Several adjustments were made to transportation emissions after they have been imported from URBEMIS.
After importing from URBEMIS, CO2 emissions are converted to metric tons and then adjusted to account for the "Pavley"
regulation. Then, CO2 is converted to CO2e by multiplying by 100/95 to account for the contribution of other GHGs (CH4, N2O, and HFCs [from leaking air condi
Finally, CO2e is adjusted to account for th low carbon fuels rule.

Baseline	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				17,289.25	76.01%
Area Source:	165.86	0.59	0.00	179.12	0.79%
Electricity:	2,740.77	0.02	0.01	2,745.16	12.07%
Natural Gas:	634.08	0.06	0.00	635.71	2.79%
Water & Wastewater:	71.87	0.00	0.00	71.98	0.32%
Solid Waste:	13.33	86.28	N/A	1,825.24	8.02%
Agriculture:	0.00	0.00	0.00	0.00	0.00%
Off-Road Equipment:	0.00	0.00	0.00	0.00	0.00%
Refrigerants:	N/A	N/A	N/A	0.00	0.00%
Sequestration:	N/A	N/A	N/A	N/A	N/A
Purchase of Offsets:	N/A	N/A	N/A	N/A	N/A
Total:				22,746.46	100.00%

tioners]).

Mitigated	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				29,915.04	58.14%
Area Source:	959.39	3.44	0.00	1,036.55	2.01%
Electricity:	9,539.72	0.08	0.04	9,554.99	18.57%
Natural Gas:	3,593.46	0.34	0.01	3,602.67	7.00%
Water & Wastewater:	346.77	0.00	0.00	347.33	0.67%
Solid Waste:	48.68	331.01	N/A	6,999.83	13.60%
Agriculture:	0.00	0.00	0.00	0.00	0.00%
Off-Road Equipment:	0.00	0.00	0.00	0.00	0.00%
Refrigerants:	N/A	N/A	N/A	0.00	0.00%
Sequestration:	N/A	N/A	N/A	0.00	0.00%
Purchase of Offsets:	N/A	N/A	N/A	0.00	0.00%
Total:				51,456.41	100.00%

Mitigation Measures Selected:

Transportation: Go to the following tab: Transp. Detail Mit for a list of the transportation mitigation measures selected (in URBE

Electricity: The following mitigation measure(s) have been selected to reduce electricity emissions.

Cool Roofs/Green Roofs	5000	kwh/year reduced

Natural Gas: The following mitigation measure(s) have been selected to reduce natural gas emissions.

Cool Roofs/Green Roofs	2	
Tankless Water Heater	5000	MMBtu/year Reduced

Water and Wastewater: The following mitigation measure(s) have been selected to reduce water and wastewater emissions.

Drought Tolerant Landscaping	10	% Reduction Outdoor Use
Low Flush Toilets	2	% Reduction Indoor Use

Solid Waste: The following mitigation measure has been selected to reduce solid waste related GHG emissions.

Ag: No existing mitigation measures available.

Off-Road Equipment: No existing mitigation measures available.

Refrigerants: The following mitigation measure has ben selected to reduce refrigerant emissions:

Carbon Sequestration: Project does not include carbon sequestration through tree planting.

Emission Offsets/Credits: Project does not include purchase of emission offsets/credits.

Transportation

Operational Mitigation Residential

Transportation Detail for Operational Mitigation

Operational NonResidential Mitigation

Operational Annual Miscellaneous Detail

Includes correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 0.00 Nonresidential Trip % Reduction: 0.00

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

APPENDIX I

MOORE BIOLOGICAL CONSULTANTS

November 23, 2007

Mr. Nick Pappani
Raney Planning & Management
1401 Halyard Drive, Ste. 120
West Sacramento, CA 95691

Subject: BASELINE BIOLOGICAL RESOURCES INVENTORY: 400+/- ACRE BRENTWOOD BOULEVARD SPECIFIC PLAN, BRENTWOOD, CALIFORNIA

Dear Nick:

Thank you for contracting with Moore Biological Consultants to conduct a baseline biological resources inventory of the Brentwood Boulevard Specific Plan site (Figures 1 and 2). The focus of our work was to document existing biological resources at the site, conduct a survey to determine presence or absence of Waters of the U.S. and wetlands, and search for suitable habitat for or presence of sensitive species within the specific plan area. This letter report details the methodology and results of our investigation.

Methods

Prior to the field surveys, we conducted a query of California Department of Fish and Game's (CDFG) California Natural Diversity Database (CNDDB, 2007); an updated search was conducted in October 2007. This information was used to identify species that have been previously documented in the project vicinity or have the potential to occur in the project vicinity based on presence of suitable habitat and geographical distribution. Since the site is located in the central portion of the USGS 7.5-minute Brentwood topographic quadrangle, the CNDDB

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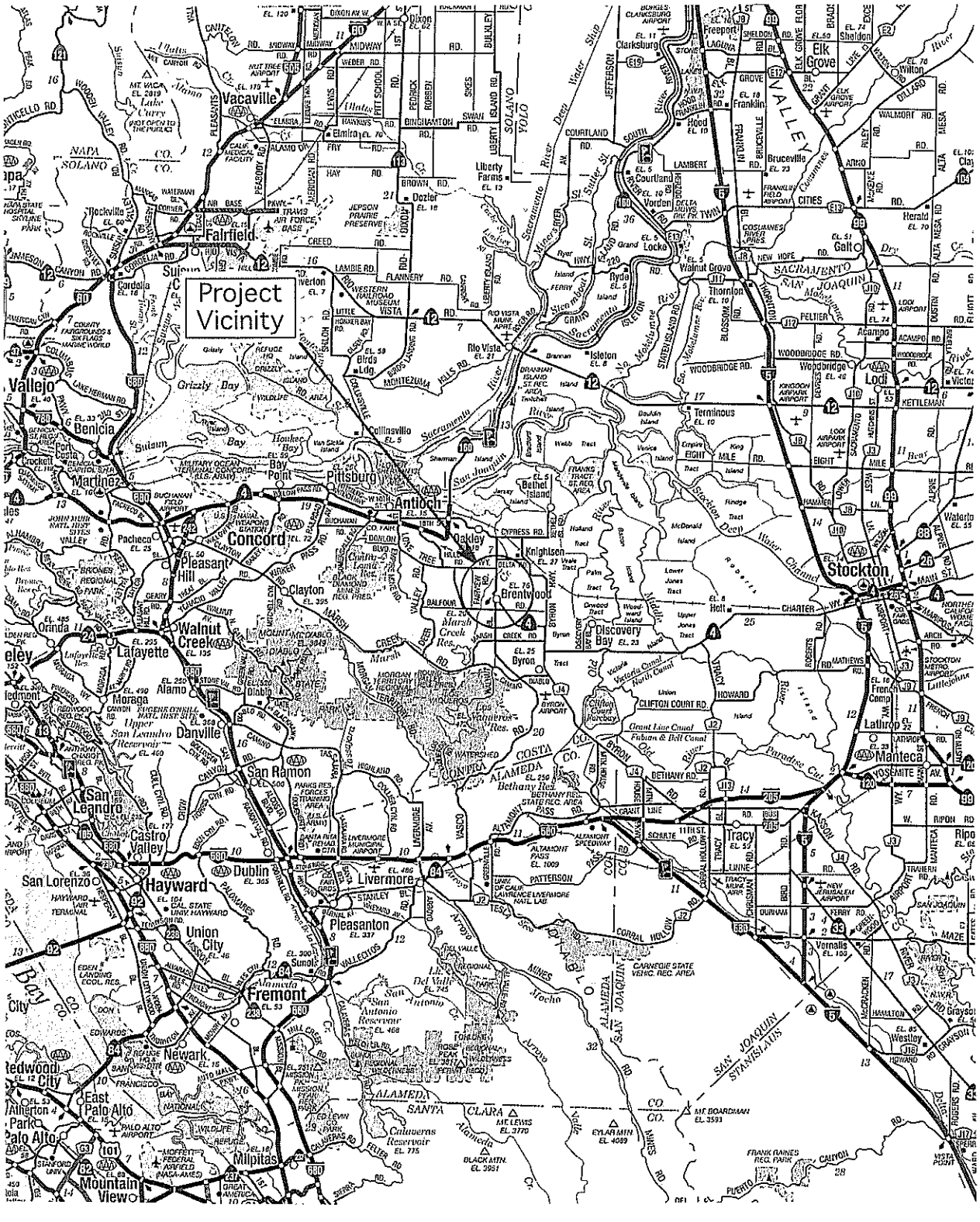

Scale: 1 inch = 9 miles

Source: Calif. State Automobile Association

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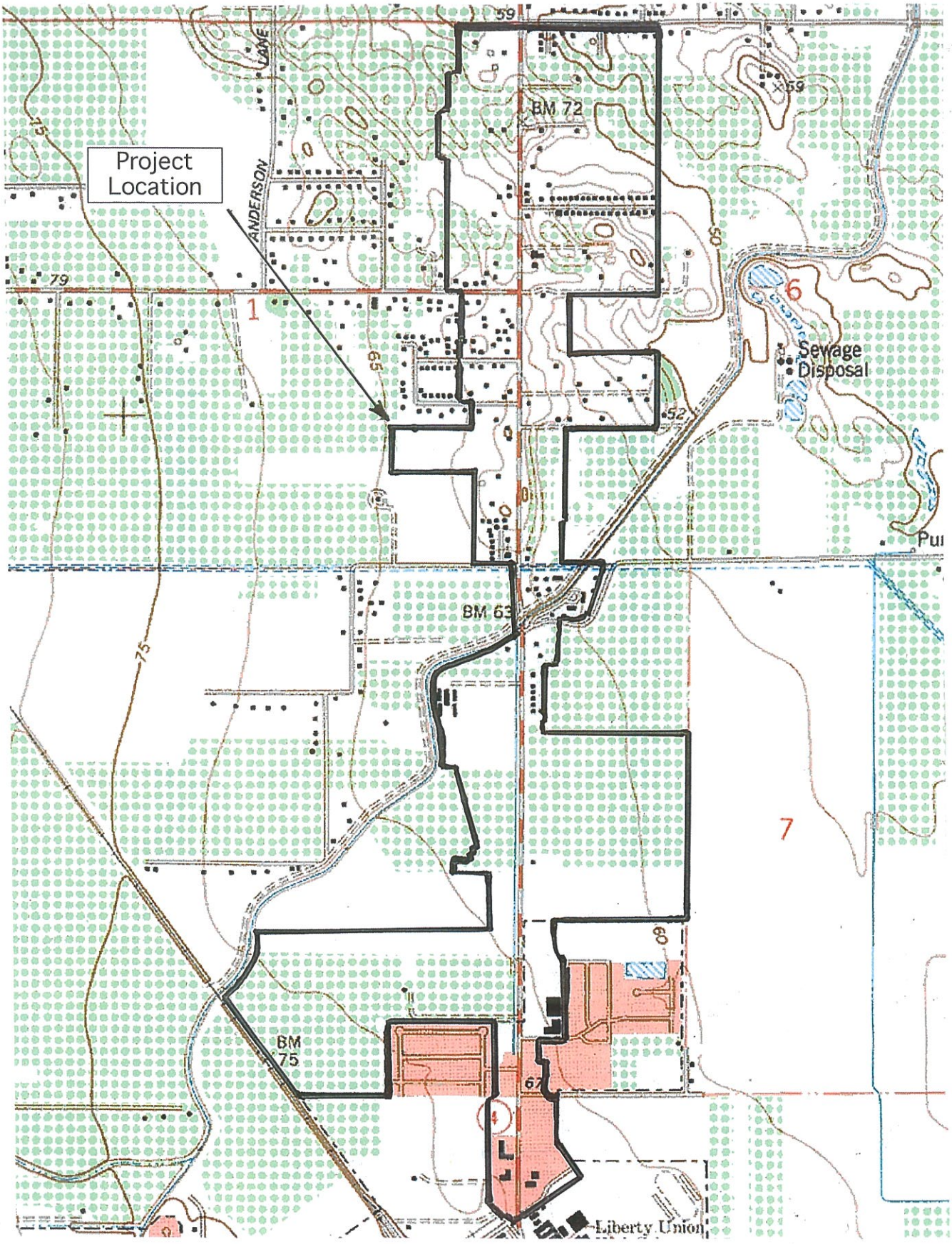
FIGURE 1
PROJECT VICINITY



Scale: 1 inch = 1,500 feet

Source: USGS 7.5-minute Brentwood topographic quadrangle

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FIGURE 2
PROJECT LOCATION

search encompassed just this quadrangle. This search area is approximately 60 square miles surrounding the site. The East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) (Jones & Stokes, 2006) was reviewed for information regarding habitat types and species known or potentially occurring in the area. John Kopchik (Contra Costa County Community Development Department) and Dave Zipkin (Jones & Stokes Associates) were contacted regarding the HCP/NCCP mitigating biological resources impacts resulting from future development in the specific plan area.

Field surveys were conducted on September 20 and October 9, 2007 and included the specific plan area (Figure 2), and a number of off-site bike path and utility corridors (see attached maps of off-site corridors). The field effort involved driving and walking throughout the survey areas making observations and noting habitat conditions, surrounding land uses, and plant and wildlife species. The surveys included an assessment of potentially jurisdictional Waters of the U.S. (a term that includes wetlands) as defined by the U.S. Army Corps of Engineers (ACOE, 1987), sensitive species, and suitable habitat for sensitive species (e.g., vernal pools, burrows, blue elderberry shrubs). Additionally, on-site trees were assessed for the potential use by nesting raptors, especially Swainson's hawk (*Buteo swainsoni*), and on-site burrows were inspected for evidence of burrowing owl (*Athene cunicularia*) occupancy.

Results

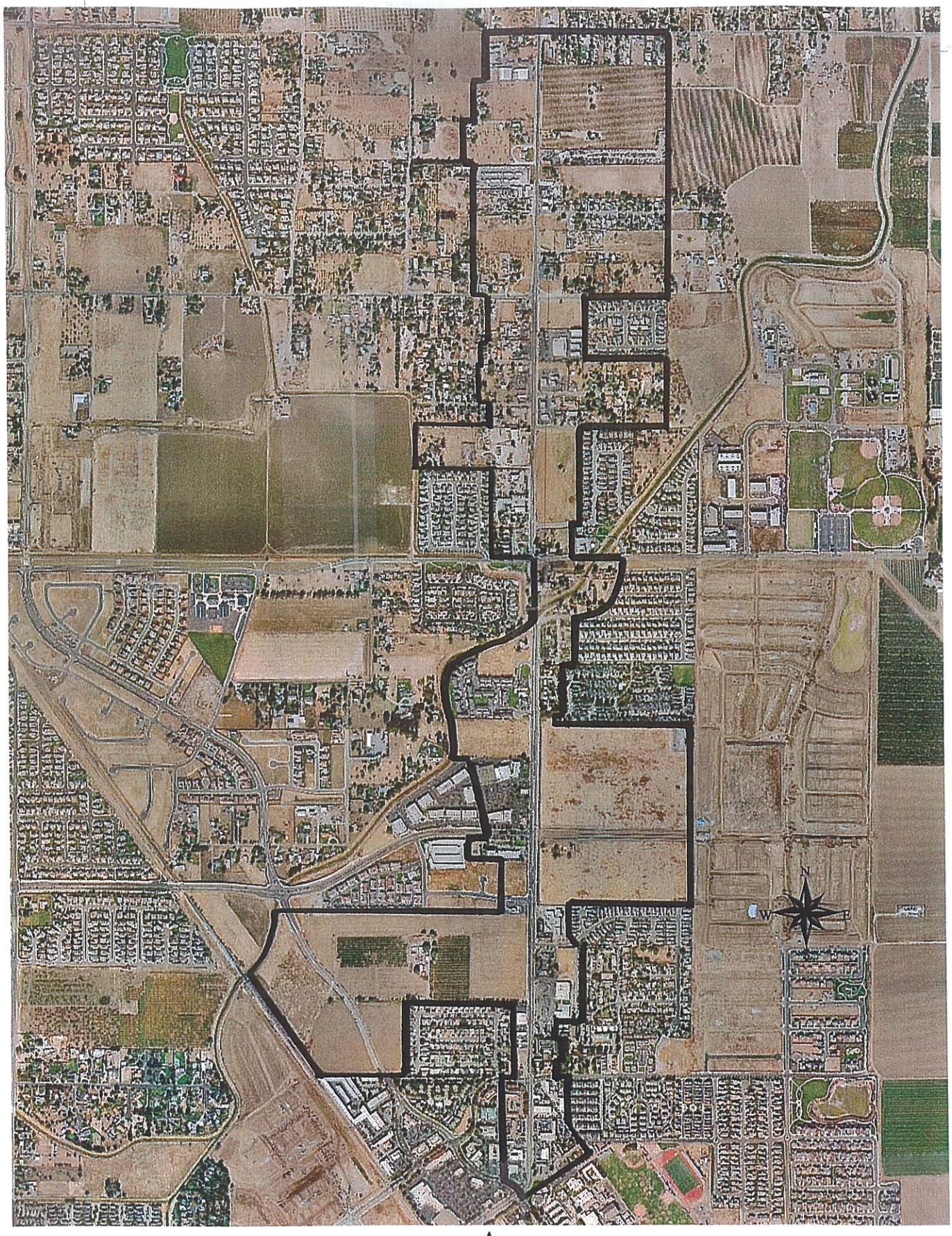
GENERAL SETTING: The specific plan area and off-site corridors are located in Brentwood, in Contra Costa County, California (Figure 1). The site is within Sections 1, 12 and 13, within Township 1 North, Range 2 East, and Sections 7, 17 and 18, within Township 1 North, Range 3 East of the USGS 7.5-minute Brentwood topographic quadrangle (Figure 2). Elevations within the plan area and off-site corridors range from approximately 40 to 75 feet above mean sea level. In the north part of the plan area, site topography is very gently rolling hills;

the south part of the plan area is essentially flat. Marsh Creek flows through the central part of the specific plan area from southwest to northeast.
Land uses in this part of east Contra Costa County are primarily agricultural and open space, with residential and commercial areas in and near existing cities (Figure 3). The specific plan area is surrounded on all sides by existing subdivisions, subdivisions under construction, residential ranchettes, and fields farmed primarily in orchards or annual crops.

LAND COVER TYPES: Much of the specific plan area and off-site corridors is already developed, lacking vegetation beyond landscape ornamentals. The developed areas appear to meet the Land Cover criteria of "Developed: Urban" in the HCP/NCCP (Jones & Stokes, 2006). There are also a few patches of cropland (i.e., row crops), vineyards, and orchard; these areas support little vegetation beyond the planted crops (see attached photographs). These agricultural areas appear to meet the Land Cover criteria of "Irrigated Agriculture: Cropland", "Irrigated Agriculture: Vineyard", and "Irrigated Agriculture: Orchard" in the HCP/NCCP (Jones & Stokes, 2006).

The majority of the undeveloped parts of the plan area consist of fallow annual grassland and ruderal grassland fields that are routinely disked for fire suppression and are unremarkable with respect to plant composition. Beyond an assemblage of grasses and weeds, these fields contain essentially no other vegetation. These grassland areas appear to meet the Land Cover criteria of "Grassland: Annual Grassland", "Grassland: Ruderal" in the HCP/NCCP (Jones & Stokes, 2006). Finally Marsh Creek is best classified as Land Cover of "Aquatic: Stream" in the HCP/NCCP (Jones & Stokes, 2006).

VEGETATION: The annual grassland and ruderal grassland fields, and ruderal areas along Marsh Creek and some of the road shoulders are vegetated with various non-native annual grass and weed species. Grasses including oats (*Avena* sp.), soft chess brome (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), foxtail barley (*Hordeum murinum*), and perennial ryegrass (*Lolium perenne*) are



Scale: 1 inch = 1,500 feet

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FIGURE 3
AERIAL PHOTOGRAPH

the dominant grass species in the ruderal grassland. In many areas, other grassland species such as yellow star-thistle (*Centaurea solstitialis*), fiddleneck (*Amsinckia menziesii*), dove weed (*Eremocarpus setigerus*), common mallow (*Malva neglecta*), black mustard (*Brassica nigra*), bull thistle (*Cirsium vulgare*), morning glory (*Convolulus arvensis*), and prickly lettuce (*Lactuca serriola*) are intermixed with the grasses. Table 1 is a list of plant species observed in the study area.

Virtually all of the trees in the study area appear to have been planted, either as orchard trees, windbreaks, or ornamental landscape trees. The more common trees include blue gum (*Eucalyptus* sp.), mulberry (*Morus alba*), pines (*Pinus* sp.), valley oaks (*Quercus lobata*), interior live oaks (*Quercus wislizenii*), palms (*Phoenix* sp.; *Washingtonia* sp.), English walnuts (*Juglans regia*), tree-of-heaven (*Ailanthus altissima*), and black walnuts (*Juglans californica*). There are also a variety of fruit trees and other ornamentals primarily associated with the on-site residences and commercial parcels in the southeast part of the plan area.

Marsh Creek has been realigned and channelized; the creek corridor is also routinely cleared of vegetation to maintain hydraulic capacity (Figure 3 and attached photographs). There is a poorly developed riparian corridor along Marsh Creek supporting no trees. There are a few patches of California wild rose (*Rosa californica*) along the banks of the creek and a few stands of tule (*Scirpus acutus*) and cattail (*Typha* sp.) in some areas. Herbaceous vegetation along the edges of the water includes water smartweed (*Polygonum* sp.), umbrella sedge (*Cyperus eragrostis*), annual beardgrass (*Polypogon monspeliensis*), curly dock (*Rumex crispus*), and cocklebur (*Xanthium strumarium*).

There is a small group of blue elderberry (*Sambucus mexicana*) shrubs along a future off-site utility corridor just west of the north part of the specific plan area (Figure 4 and attached photograph). The shrubs are along the fence lines of a few ruderal grassland fields that the corridor passes between. It is not clear if

TABLE 1

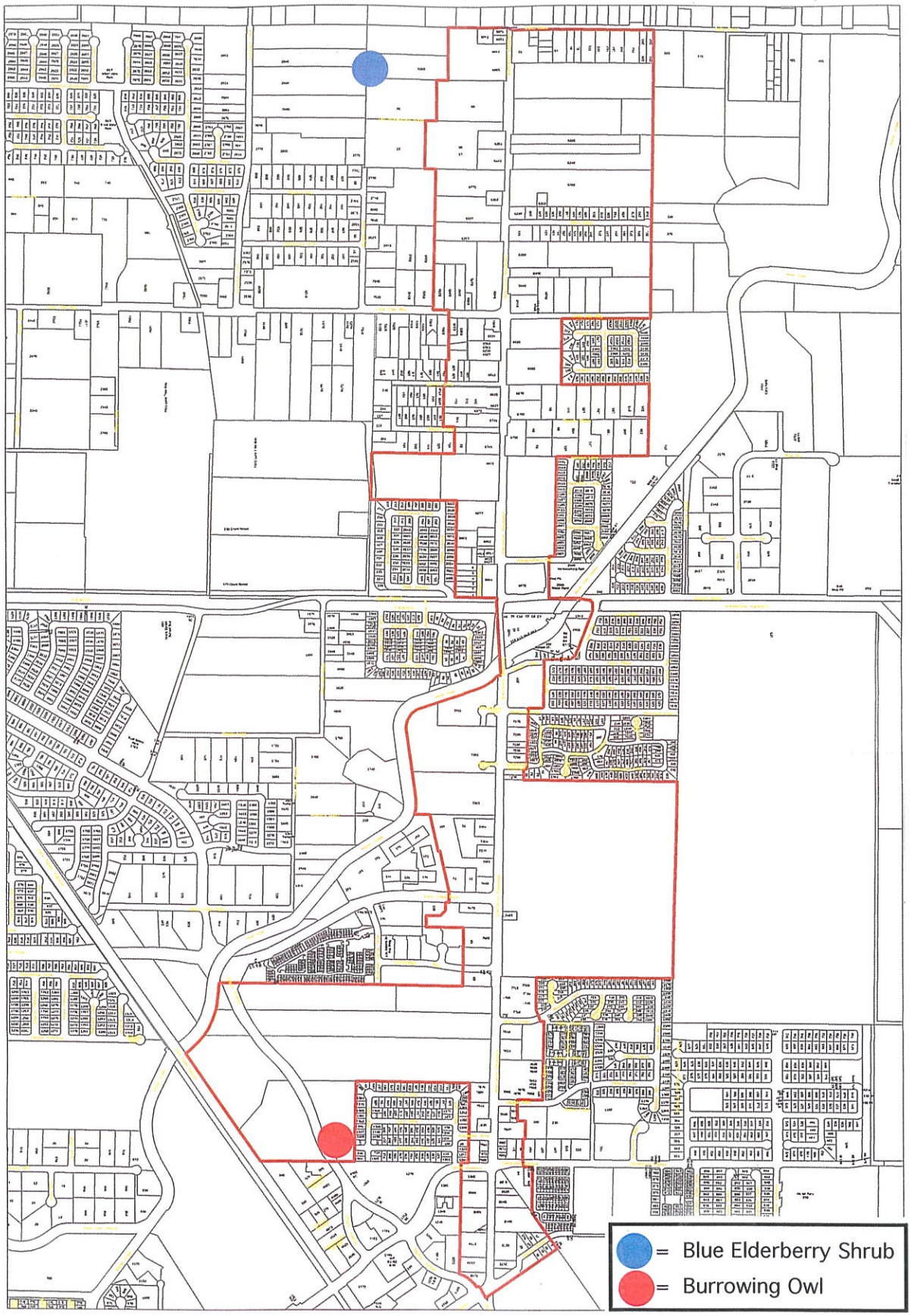
PLANT SPECIES OBSERVED DURING THE 2007 SURVEYS

Scientific Name	Common Name
Ailanthus altissima	tree of heaven
Amaranthus albus	pigweed
Amsinckia menziesii	fiddleneck
Avena sp.	oat
Brassica nigra	black mustard
Bromus diandrus	ripgut brome
Bromus hordeaceus	soft chess brome
Cardaria pubescens	white-top
Carduus pycnocephalus	Italian thistle
Centaurea solstitialis	yellow star-thistle
Cirsium vulgare	bull thistle
Convolvulus arvensis	morning glory
Cynodon dactylon	Bermuda grass
Cyperus eragrostis	umbrella sedge
Distichlis spicata	salt grass
Epilobium angustifolium	fireweed
Epilobium brachycarpum	willow weed
Eremocarpus setigerus	dove weed
Erodium botrys	filaree
Eucalyptus globulus	blue gum
Helianthus annuus	common sunflower
Hordeum murinum	foxtail barley
Juglans californica	black walnut
Juglans regia	English walnut
Lactuca serriola	prickly lettuce
Lepidium latifolium	perennial pepper weed

TABLE 1 (Continued)

PLANT SPECIES OBSERVED DURING THE 2007 SURVEYS

Lolium perenne	perennial ryegrass
Malva neglecta	common mallow
Morus alba	mulberry
Olea europaea	olive
Oleander sp.	oleander
Phoenix sp.	date palm
Pinus sp.	ornamental pine
Polygonum sp.	water smartweed
Polypogon monsepliensis	annual beard grass
Populus fremontii	Fremont cottonwood
Prunus dulcis	almond
Quercus lobata	valley oak
Quercus wislizenii	Interior live oak
Raphanus sativus	wild radish
Rosa californica	California wild rose
Rumex crispus	curly dock
Salix spp.	willows
Salsola tragus	tumbleweed
Sambucus mexicana	blue elderberry
Scirpus acutus	tule
Sonchus asper	prickly sow thistle
Sorghum halepense	Johnsongrass
Typha spp.	cattail
Ulmus sp.	elm
Washingtonia sp.	fan palm
Xanthium strumarium	cocklebur



Scale: 1 inch = 1,500 feet

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FIGURE 4
SENSITIVE BIOLOGICAL RESOURCES

area or off-site corridors, although it is possible there are additional blue elderberry shrubs in some areas that could not be comprehensively inspected due to access limitations.

WILDLIFE: A limited variety wildlife species were observed during the 2007 surveys; all are common species of eastern Contra Costa County (Table 2). Several birds were flying over and perching in trees in the study area. Turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), burrowing owl, American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), western scrub jay (*Aphelocoma coerulescens*), Brewer's blackbird (*Euphagus cyanocephalus*), and European starling (*Sturnus vulgaris*) are representative bird species observed in the site.

There are several large trees in the study area that are suitable for nesting raptors and other protected migratory birds. Given the presence of nesting habitat (large trees) in and near the specific plan area, it is likely one or more pairs of raptors, plus a variety of songbirds, nest in trees in the area each year. Additionally, burrowing owls likely nest is some parts of the study area each year; a single burrowing owl was observed perched near a burrow on the east side of O'Hara Avenue in the south part of the study area (Figure 4 and attached photograph). As the survey was conducted between the nesting and wintering seasons, it is not known if burrowing owls nested in this area during 2007.

A variety of mammals likely use habitats in the site on a year-round or seasonal basis. California ground squirrel (*Spermophilus beecheyi*) and black-tailed hare (*Lepus californicus*) were the only mammals observed during the recent survey. However, sign of raccoon (*Procyon lotor*) and striped skunk (*Mephitis mephitis*) were also observed. Although none were seen, coyote (*Canis latrans*) and Virginia opossum (*Didelphis virginiana*) are expected to occur in the site. A number of species of small rodents including mice (*Mus musculus, Reithrodontomys megalotis,* and *Peromyscus maniculatus*) and voles (*Microtus californicus*) also likely occur.

TABLE 2

WILDLIFE SPECIES OBSERVED DURING THE 2007 SURVEY

Birds	
Great egret	*Casmerodius albus*
Mallard	*Anas platyrhynchos*
Turkey vulture	*Cathartes aura*
Red-tailed hawk	*Buteo jamaicensis*
American kestrel	*Falco sparverius*
Burrowing owl	*Athene cunicularia*
Rock dove	*Columba livia*
Mourning dove	*Zenaida macroura*
Northern flicker	*Colaptes auratus*
Barn swallow	*Hirundo rustica*
Western kingbird	*Tyrannus verticalis*
Black phoebe	*Sayornis nigricans*
Western scrub jay	*Aphelocoma coerulescens*
American crow	*Corvus brachyrhynchos*
Brewer's blackbird	*Euphagus cyanocephalos*
Northern mockingbird	*Mimus polyglottos*
European starling	*Sturnus vulgaris*
House sparrow	*Passer domesticus*
Mammals	
Black-tailed hare	*Lepus californicus*
Raccoon	*Procyon lotor*
California ground squirrel	*Spermophilus beecheyi*
Striped skunk	*Mephitis mephitis*
Reptiles and Amphibians	
Western fence lizard	*Sceloporus occidentalis*
Pacific chorus frog	*Pseudacris regilla*
Bull frog	*Rana catesbeiana*

Based on habitat types present, a limited variety of amphibians and reptiles are expected to use habitats in the study area. Western fence lizard (*Sceloporus occidentalis*) was the only reptile observed during the recent surveys; Pacific chorus frog (*Pseudacris regilla*) and bullfrog (*Rana catesbeiana*) were the only amphibians observed. Common species such as Gilbert's skink (*Eumeces gilbertii*) and western terrestrial garter snake (*Thamnophis elegans*) are expected to occur in the specific plan area.

WATERS OF THE U.S. AND WETLANDS: Waters of the U.S., including wetlands, are broadly defined under 33 Code of Federal Regulations (CFR) 328 to include navigable waterways, their tributaries, and adjacent wetlands. State and federal agencies regulate these habitats and Section 404 of the Clean Water Act requires that a permit be secured prior to the discharge of dredged or fill materials into any waters of the U.S., including wetlands. Both CDFG and ACOE have jurisdiction over modifications to riverbanks, lakes, stream channels and other wetland features.

Although definitions vary to some degree, wetlands are generally considered to be areas that are periodically or permanently inundated by surface or ground water, and support vegetation adapted to life in saturated soil. Jurisdictional wetlands are vegetated areas that meet specific vegetation, soil, and hydrologic criteria defined by the ACOE *Wetlands Delineation Manual* (ACOE, 1987). Waters of the U.S. are drainage features or water bodies as described in 33 CFR 328.4. ACOE holds sole authority to determine the jurisdictional status of waters of the U.S., including wetlands.

Jurisdictional wetlands and Waters of the U.S. include, but are not limited to, perennial and intermittent creeks and drainages, lakes, seeps, and springs; emergent marshes; riparian wetlands; and seasonal wetlands. Wetlands and Waters of the U.S. provide critical habitat components, such as nest sites and a reliable source of water, for a wide variety of wildlife species.

The only potentially jurisdictional water of the U.S. observed in the study area is Marsh Creek, which flows through the central part of the specific plan area from southwest to northeast (Figure 2, 3 and attached photographs). The creek is perennial due to irrigation nuisance water and contained a few feet of water during the recent surveys. There is a poorly developed riparian corridor along Marsh Creek supporting California wild rose, tule, cattail, water smartweed, umbrella sedge, annual beardgrass, curly dock, cocklebur, and other herbaceous hydrophytes. The creek bed is located in an incised trapezoidal channel that is up to 15 feet below the adjacent uplands and approximately 60 feet wide. The active channel has a mean width of approximately 10 to 20 feet.

Marsh Creek is depicted as a "blue-line" stream on the USGS topographic map (Figure 2). It continues north off-site, drains through an expansive shallow water area called "Big Break", and is eventually tributary to the San Joaquin River, which is a navigable Water of the U.S. This tributary relationship with navigable Waters of the U.S. forms the basis for Marsh Creek falling under the jurisdiction of agencies including ACOE, CDFG, and the California Regional Water Quality Control Board (RWQCB).

Beyond Marsh Creek, no other potential jurisdictional wetlands or Waters of the U.S. were observed in the site. The site consists of developed areas, orchards, vineyards, row crops, and upland grassland and ruderal grassland fields. No other areas were observed within or adjacent to the site appearing to have any potential to fall under ACOE jurisdiction. Specifically, no vernal pools, seasonal wetlands, marshes, swamps, ponds, lakes, or other wetlands of any type were observed within the specific plan area of along the off-site corridors.

SPECIAL-STATUS SPECIES: Special-status species are plants and animals that are legally protected under the state and/or federal Endangered Species Act or other regulations. The Federal Endangered Species Act (FESA) of 1973 declares that all federal departments and agencies shall utilize their authority to conserve endangered and threatened plant and animal species. The California

Endangered Species Act (CESA) of 1984 parallels the policies of FESA and pertains to native California species.

Special-status species also include other species that are considered rare enough by the scientific community and trustee agencies to warrant special consideration, particularly with regard to protection of isolated populations, nesting or denning locations, communal roosts, and other essential habitat. The presence of species with legal protection under the Endangered Species Act often represents a major constraint to development, particularly when the species are wide-ranging or highly sensitive to habitat disturbance and where proposed development would result in a take of these species.

Sensitive plants are those which are designated rare, threatened, or endangered and candidate species for listing by the U.S. Fish and Wildlife Service (USFWS). Sensitive plants also include species considered rare or endangered under the conditions of Section 15380 of the California Environmental Quality Act Guidelines, such as those plant species identified on Lists 1A, 1B and 2 in the Inventory of Rare and Endangered Vascular Plants of California by the California Native Plant Society (CNPS, 2001). Finally, sensitive plants may include other species that are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status, such as those included on List 3 in the CNPS Inventory.

Table 3 provides a summary of the listing status and habitat requirements of sensitive species that have been documented in the project vicinity or for which there is potentially suitable habitat in the area. This table also includes an assessment of the likelihood of occurrence of each of these species in the site. The evaluation of the potential for occurrence of each species is based on the distribution of regional occurrences (if any), habitat suitability of the site, and field observations. The table includes sensitive species recorded in the CNDDB (2007) in the Brentwood topographic quadrangle, and species for which the HCP/NCCP (Jones & Stokes, 2006) identifies suitable habitat in the plan area.

TABLE 3

SENSITIVE PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

Common Name	Scientific Name	Federal Status[1]	State Status[2]	CNPS List[3]	Habitat	Potential for Occurrence in the Study Area
PLANTS						
San Joaquin spearscale	*Atriplex joaquiniana*	None	None	1B	Chenopod scrub, alkali meadow, valley and alkali foothill grassland.	Extremely low: there is no chenopod scrub or alkali meadow habitat in the plan area. The annual grassland habitat is highly disturbed by past farming and ongoing disking. In it's current condition, the site does not contain suitable habitat for San Joaquin spearscale. The closest occurrence of this species recorded in the CNDDB (2007) in the Brentwood topographic quadrangle is approximately 3 miles southwest of the site. The HCP/NCCP (Jones & Stokes, 2006) does not identify the plan area as suitable habitat for San Joaquin spearscale.
Big tarplant	*Blepharizonia plumosa*	None	None	1B	Valley and foothill grassland.	Extremely low: the annual grassland habitat in the site is highly disturbed by past farming and ongoing disking. In it's current condition, the site does not contain suitable habitat for this species. The closest occurrence of big tarplant recorded in the CNDDB (2007) in the Brentwood topographic quadrangle is approximately 3 miles southwest of the site. The HCP/NCCP (Jones & Stokes, 2006) does not identify the plan area as suitable habitat for big tarplant.
Round-leaved filaree	*Erodium macrophyllum*	None	None	2	Cismontane woodland and valley and foothill grassland	Extremely low: there is no cismontane woodland habitat in the plan area. The annual grassland habitat is highly disturbed by past farming and ongoing disking. In it's current condition, the site does not contain suitable habitat for this species. The closest occurrence of round-leaved filaree recorded in the CNDDB (2007) in the Brentwood topographic quadrangle is approximately 3 miles southwest of the site. The HCP/NCCP (Jones & Stokes, 2006) does not identify the plan area as suitable habitat for round-leaved filaree.

TABLE 3

SENSITIVE PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

Common Name	Scientific Name	Federal Status[1]	State Status[2]	CNPS List[3]	Habitat	Potential for Occurrence in the Study Area
Suisun Marsh aster	*Symphyotrichum lentum*	None	None	1B	Marshes and swamps (brackish and freshwater)	Extremely low: beyond a few patches of cattails and tules in Marsh Creek, there is no marsh or swamp habitat in the plan area. Marsh Creek is highly disturbed by channelization, adjacent urban uses, and routine maintenance. In it's current condition, Marsh Creek does not contain suitable habitat for Suisun Marsh aster. The closest occurrence of this species recorded in the CNDDB (2007) in the Brentwood topographic quadrangle is mapped approximately 3 miles north of the site in the expansive marshes of "Big Break". The HCP/NCCP (Jones & Stokes, 2006) does not address Suisun Marsh aster.
Caper-fruited tropidocarpum	*Tropidocarpum capparideum*	None	None	1A	Valley and foothill grassland, alkaline soils.	Extremely low: The annual grassland habitat in the site is highly disturbed by past farming and ongoing disking. In it's current condition, the site does not contain suitable habitat for caper-fruited tropidocarpum. The closest occurrence of this species recorded in the CNDDB (2007) in the Brentwood topographic quadrangle is mapped approximately 4 miles southeast of the site near Byron. The HCP/NCCP (Jones & Stokes, 2006) does not address caper-fruited tropidocarpum.
WILDLIFE						
Mammals						
Townsend's big-eared bat	*Corynorhinus townsendii*	None	SC	N/A	Wide variety of habitats, most common in desert scrub, mixed conifer forest, and pinyon-juniper or pine forest.	Very low: although there is no desert scrub, mixed conifer forest,or pinyon-juniper or pine forest habitat in the area, trees and some of the buildings within the plan area may be suitable roost sites for Townsend's big-eared bat. There are no occurrences of Townsend's big-eared bat recorded in the CNDDB (2007) in the Brentwood topographic quadrangle. The HCP/NCCP (Jones & Stokes, 2006) reports that there are no verified records of Townsend's big-eared bat within the HCP/NCCP inventory area.

TABLE 3

SENSITIVE PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

Common Name	Scientific Name	Federal Status[1]	State Status[2]	CNPS List[3]	Habitat	Potential for Occurrence in the Study Area
San Joaquin kit fox	*Vulpes macrotis mutica*	E	T	N/A	Open, dry annual or perennial grasslands and scrublands with loose textured soils for denning.	Extremely low: no potential dens were located during the field surveys. In it's current condition, the site does not contain suitable habitat for San Joaquin kit fox. The north tip of the known species' range near Brentwood is several miles south and the plan area; kit fox also occur in the hills many miles west of the plan area. The closest occurrences of San Joaquin kit fox recorded in the CNDDB (2007) within the Brentwood topographic quadrangle are approximately 4 to 5 miles south and southeast of the site; these records are 15 to 20 years old. The HCP/NCCP (Jones & Stokes, 2006) does not identify the plan area as suitable core habitat or suitable low-use habitat for San Joaquin kit fox.
Birds						
Golden eagle	*Aquila chrysaetos*	None	SC	N/A	Nesting areas are associated with cliff-walled canyons and large trees. Forages in rolling hills and mountain areas	Very low: trees within the plan are largely unsuitable for nesting use by golden eagles, as they prefer trees and cliff walls isolated from any type of disturbance. There are no occurrences of this species recorded in the CNDDB (2007) in the Brentwood topographic quadrangle. The HCP/NCCP (Jones & Stokes, 2006) identifies a few grassland areas within the plan area as suitable foraging habitat for golden eagle.
Swainson's hawk	*Buteo swainsoni*	None	T	N/A	Breeds in stands of tall trees in open areas. Requires adjacent suitable foraging habitats such as grasslands or alfalfa fields supporting rodent populations.	Low: it is unlikely that Swainson's hawks would nest in such an urban setting. Larger trees within the plan areas are potential, yet marginal nesting habitat for this species and the annual and ruderal grasslands are very marginal potential Swainson's hawk foraging habitat. The closest occurrences of nesting Swainson's hawks recorded in the CNDDB (2007) within the Brentwood topographic quadrangle are approximately 3 to 4 miles north, west, south, and southeast of the study area. The HCP/NCCP (Jones & Stokes, 2006) contains one record of Swainson's hawks within the plan area, right along Brentwood Boulevard, but does not identify the plan area as suitable foraging habitat for Swainson's hawk.

TABLE 3

SENSITIVE PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

Common Name	Scientific Name	Federal Status[1]	State Status[2]	CNPS List[3]	Habitat	Potential for Occurrence in the Study Area
Burrowing owl	*Athene cunicularia*	None	SC	N/A	Open, dry annual or perennial grasslands, deserts and scrublands; dependent upon burrowing mammals.	Present: a single burrowing owl was observed perched near a burrow on the east side of O'Hara Avenue in the south part of the study area. A number of ground squirrel burrows were observed elsewhere within the site. There are several occurrences of nesting burrowing owl in the CNDDB (2007) in the area, including a few occurrences within 1 mile of the study area. The HCP/NCCP (Jones & Stokes, 2006) identifies a few areas within the plan area as low use burrowing owl habitat.
Tricolored blackbird	*Agelaius tricolor*	None	None	N/A	Requires open water and protected nesting substrate, usually cattails, and surrounding foraging habitat of annual grassland.	Low: Marsh Creek is highly disturbed by channelization, adjacent urban uses, and routine maintenance. Beyond a few patches of cattails, tules, and wild rose in Marsh Creek that are considered marginal for nesting tricolored blackbirds, there is no suitable tricolored blackbird nest habitat in the plan area. The only occurrence of nesting tricolored blackbird recorded in the CNDDB (2007) within the Brentwood topographic quadrangle is approximately 4 miles southwest of the study area. The annual and ruderal grasslands are marginal tricolored blackbird foraging habitat. The HCP/NCCP (Jones & Stokes, 2006) identifies Marsh Creek as suitable core habitat and a few grassland areas in the plan area as primary or secondary tricolored blackbird foraging habitat.
Loggerhead shrike	*Lanius ludovicianus*	None	SC	N/A	Annual grasslands and agricultural areas throughout the Central Valley.	Very low: the annual grassland habitat in the site is highly disturbed by past farming and ongoing disking for fire suppression. In it's current condition, the site does not contain suitable nesting habitat for this species. However, loggerhead shrike may fly over or forage in the site on occasion. The closest occurrence of loggerhead shrike recorded in the CNDDB (2007) within the Brentwood topographic quadrangle is approximately 2 miles north of the site. The HCP/NCCP (Jones & Stokes, 2006) does not address loggerhead shrike.

TABLE 3

SENSITIVE PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

Common Name	Scientific Name	Federal Status[1]	State Status[2]	CNPS List[3]	Habitat	Potential for Occurrence in the Study Area
Amphibians						
California tiger salamander	*Ambystoma californiense*	T	SC	SC	Seasonal water bodies without fish (i.e., vernal pools and stock ponds) and grassland/ woodland habitats containing summer refugia (i.e., burrows).	Extremely low: The project site does not contain suitable breeding or aestivation habitat for this species. The closest occurrence of California tiger salamander recorded in the CNDDB (2007) within the Brentwood topographic quadrangle is approximately 2.5 miles south of the site. The site is not within Designated Critical Habitat for California tiger salamander (USFWS, 2005a). The HCP/NCCP (Jones & Stokes, 2006) does not identify the plan areas as suitable breeding habitat or suitable migration and aestivation habitat for California tiger salamander.
California red-legged frog	*Rana aurora draytonii*	T	SC	N/A	Lowlands and foothills in or near permanent sources of water with vegetation.	Extremely low: beyond Marsh Creek, there is no aquatic habitat in the plan area. Marsh Creek is highly disturbed by channelization, adjacent urban uses, and routine maintenance. In it's current condition, Marsh Creek provides marginal habitat for California red-legged frog. There are no occurrences of this species recorded in the CNDDB (2007) in the Brentwood topographic quadrangle. The HCP/NCCP (Jones & Stokes, 2006) identifies a few areas within the plan area as potential migration and aestivation habitat for California red-legged frog, despite an absence of nearby potential breeding habitat.

TABLE 3

SENSITIVE PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

Common Name	Scientific Name	Federal Status[1]	State Status[2]	CNPS List[3]	Habitat	Potential for Occurrence in the Study Area
Reptiles						
Silvery legless lizard	*Anniella pulchra pulchra*	None	SC	N/A	Sandy or loose loamy soils under sparse vegetation.	Very low: the annual grassland habitat in the site is highly disturbed by past farming and ongoing. In it's current condition, the site provides very low quality habitat for this species. The closest occurrence of silvery legless lizard recorded in the CNDDB (2007) in the Brentwood topographic quadrangle is approximately 1 mile north of the site. The HCP/NCCP (Jones & Stokes, 2006) does not identify the plan area as suitable habitat for this species
Western pond turtle	*Actinemys marmorata*	None	SC	N/A	Marshes, rivers, streams and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying.	Very low: beyond Marsh Creek, there is no potentially suitable western pond turtle habitat in the plan area. Marsh Creek is highly disturbed by channelization, adjacent urban uses, and routine maintenance. In it's current condition, Marsh Creek provides marginal habitat for this species. The closest occurrence of western pond turtle recorded in the CNDDB (2007) in the Brentwood topographic quadrangle is approximately 2 miles north of the study area. The HCP/NCCP (Jones & Stokes, 2006) identifies Marsh Creek as suitable core habitat for western pond turtle.
Invertebrates						
Vernal pool fairy shrimp	*Branchinecta lynchi*	T	None	N/A	Vernal pools	Extremely low: no suitable vernal pool or seasonal wetland habitat exists in the site for vernal pool fairy shrimp. The closest occurrences of this species recorded in the CNDDB (2007) within the Brentwood topographic quadrangle are approximately 4 miles southwest of the study area. The HCP/NCCP (Jones & Stokes, 2006) does not identify the plan area as suitable habitat for vernal pool fairy shrimp. The site is not within designated critical habitat for vernal pool species (USFWS 2005b).

TABLE 3

SENSITIVE PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

Common Name	Scientific Name	Federal Status[1]	State Status[2]	CNPS List[3]	Habitat	Potential for Occurrence in the Study Area
Midvalley fairy shrimp	*Branchinecta mesovallensis*	None	None	N/A	Vernal pools	Extremely low: no suitable vernal pool or seasonal wetland habitat exists in the site for midvalley fairy shrimp. The only occurrence of this species recorded in the CNDDB (2007) within the Brentwood topographic quadrangle is approximately 4 miles southeast of the study area. The HCP/NCCP (Jones & Stokes, 2006) does not identify the plan area as suitable habitat for midvalley fairy shrimp.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T	None	N/A	Elderberry shrubs within the Central Valley of California.	Extremely low: Only a few blue elderberry shrubs were observed in the site. These shrubs are along a future off-site utility corridor just west of the north part of the specific plan area. There are no records of valley elderberry longhorn beetle recorded in the CNDDB (2007) in Brentwood topographic quadrangle and the specific plan area is believed to be in the extreme west part or just outside of the species' range. The HCP/NCCP (Jones & Stokes, 2006) does not provide take coverage for valley elderberry longhorn beetle.

1 T = Threatened; E = Endangered.

2 T = Threatened; E = Endangered; SC = State of California Species of Special Concern

3 CNPS List 1A includes species that are considered extinct; List 1B includes species that are rare, threatened, or endangered in California and elsewhere; List 2 includes species that are rare, threatened, or endangered in California but more common elsewhere.

Finally, although not reported in the CNDDB (2007) in the Brentwood topographic quadrangle, valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) was added to Table 3 due to the presence of blue elderberry shrubs in the study area.

While the site may have historically provided habitat for a subset of the sensitive species listed in Table 3, intensive agriculture, land leveling, urbanization, and construction and maintenance of roads, homes, and other development have substantially modified natural habitats in the project vicinity, including those of the specific plan area. The likelihood of occurrence of listed, candidate, and other sensitive species in the project site is considered generally low, as the site contains few habitat attributes for sensitive species that occur in the region.

SENSITIVE PLANTS: Five species of sensitive plants were identified in the CNDDB query (Table 3). These include San Joaquin spearscale (*Atriplex joaquiniana*), big tarplant (*Blepharizonia plumosa*), round-leaved filaree (*Erodium macrophyllum*), Suisun Marsh aster (*Aster lentus*), and caper-fruited tropidocarpum (Tropidocarpum capparideum). No sensitive plants were observed during the recent surveys and the developed areas, annual grassland, ruderal grassland, orchards, vineyards, cropland, and Marsh Creek are largely unsuitable for sensitive plants that are known from the greater project vicinity.

Sensitive plants generally occur in relatively undisturbed areas and are largely found in fairly unique vegetation communities such as vernal pools, marshes and swamps, and areas with unusual soils. On-site habitats are highly disturbed much of the specific plan area is already urbanized. Aside from grassland, none of the habitats that support sensitive plants in the greater project vicinity (e.g., chenopod scrub, cismontane woodland, marshes and swamps) were observed in the site. The annual grassland, ruderal grassland, orchard, vineyard, and cropland areas are routinely disked, mowed, and/or sprayed; the agricultural areas are also irrigated. Marsh Creek is highly maintained and does not contain

developed marsh habitat. Due to lack of habitat, the likelihood of occurrence of sensitive plants within the specific plan area is considered very low.

The specific plan area is located in the easternmost part of the HCP/NCCP (Jones & Stokes, 2006) boundary. Consequently, a few plant species such as Suisun Marsh aster or caper-fruited tropidocarpum recorded generally near Brentwood in the CNDDB (2007) are not addressed in the HCP/NCCP. The HCP/NCCP does not identify the plan area as containing suitable habitat for big tarplant, round-leaved filaree, or San Joaquin spearscale.

There are a number of plants identified in the HCP/NCCP (Jones & Stokes, 2006) that are not recorded in the CNDDB (2007) in the Brentwood topographic quadrangle and for the HCP/NCCP does not identify the plan area as containing potentially suitable habitat. For example, Mt. Diablo manzanita (*Arctostaphylos auriculata*), Diablo helianthella (*Helianthella castanea*), Brewer's dwarf flax (*Hesperolinon breweri*), and Mt. Diablo fairy-lantern (*Calochortus pulchellus*) all occur in much higher elevation hills west and southwest of the specific plan area. Brittlescale (*Atriplex depressa*) and recurved larkspur (*Delphinium recurvatum*) are only known from the Byron area, many miles southeast of the specific plan area. There are no known records of showy madia (*Madia radiata*) within the boundaries of the HCP/NCCP, and adobe navarretia (*Navarretia nigelliformis* ssp. *nigelliformis*) only occurs in vernal pools and seasonal wetlands at much higher elevation than the specific plan area. None of these species are expected to occur in the specific plan area.

SENSITIVE WILDLIFE: The potential for intensive use of habitats in the study area by sensitive wildlife species is also considered generally low. Townsend's big-eared bat (*Corynorhinus townsendii*), San Joaquin kit fox (*Vulpes macrotis mutica*) golden eagle (*Aquila chrysaetos*) Swainson's hawk, burrowing owl, tricolored blackbird (*Agelaius tricolor*), loggerhead shrike (*Lanius ludovicianus*), California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana aurora draytonii*), silvery legless lizard (*Anniella pulchra pulchra*), western

pond turtle (*Actinemys marmorata*), vernal pool fairy shrimp (*Branchinecta lynchia*), and midvalley fairy shrimp (*Branchinecta mesovallensis*) are the sensitive wildlife species either identified in the CNDDB (2007) query or for which the plan area is identified in the HCP/NCCP as containing potentially suitable habitat.

There are only four wildlife species with potential to occur in the specific plan area on more than just an occasional or transitory basis: Swainson's hawk, burrowing owl, tricolored blackbird, and valley elderberry longhorn beetle. These species are discussed at length below as they could be adversely affected by conversion of habitat to development; the birds could also be disturbed by noise if they nested on or near the project site during construction. The likelihood of occurrence of any other sensitive species identified in Table 3 is considered very low to none do not require being addressed beyond the analysis in Table 3.

SWAINSON'S HAWK: The Swainson's hawk is a migratory hawk listed by the State of California as a Threatened species. The Migratory Bird Treaty Act and Fish and Game Code of California protect Swainson's hawks year-round, as well as their nests during the nesting season (March 1 through September 15). Swainson's hawk are found in the Central Valley primarily during their breeding season, a population is known to winter in the San Joaquin Valley.

Swainson's hawks prefer nesting sites that provide sweeping views of nearby foraging grounds consisting of grasslands, irrigated pasture, hay, and wheat crops. Most Swainson's hawks are migratory, wintering in Mexico and breeding in California and elsewhere in the western United States. This raptor generally arrives in the Central Valley in mid-March, and begins courtship and nest construction immediately upon arrival at the breeding sites. The young fledge in early July, and most Swainson's hawks leave their breeding territories by late August.

The closest occurrences of nesting Swainson's hawks recorded in the CNDDB (2007) within the Brentwood topographic quadrangle are approximately 3 to 4 miles north, west, south, and southeast of the study area. Interestingly, the HCP/NCCP (Jones & Stokes, 2006) contains a record of Swainson's hawks within the plan area not contained in the CNDDB. This nest territory is mapped right along Brentwood Boulevard. The HCP/NCCP does not identify the plan area as suitable foraging habitat for Swainson's hawk.

There are numerous potential Swainson's hawk nest trees located in the specific plan area and the grassland and annual croplands in the site and surrounding areas are moderately suitable for foraging Swainson's hawk. However, the developed areas, vineyards, and orchards that cover much of the site are not suitable Swainson's hawk foraging habitat. CDFG's *Staff Report regarding Mitigation for Impacts to Swainson's Hawks (Buteo Swainsoni) in the Central Valley of California* (CDFG, 1994) describes unsuitable foraging habitat as areas where prey species (even if present) are unavailable due to vegetation characteristics; orchards and vineyards are included as specific examples of unsuitable foraging habitat.

BURROWING OWL: The Migratory Bird Treaty Act and Fish and Game Code of California protect burrowing owls year-round, as well as their nests during the nesting season (February 1 through August 31). Burrowing owls are a year-long resident in a variety of grasslands as well as scrub lands that have a low density of trees and shrubs with low growing vegetation; burrowing owls that nest in the Central Valley may winter elsewhere.

The primary habitat requirement of the burrowing owl is small mammal burrows for nesting. The owl usually nests in abandoned ground squirrel burrows, although they have been known to dig their own burrows in softer soils. In urban areas, burrowing owls often utilize artificial burrows including pipes, culverts, and piles of concrete pieces. This semi-colonial owl breeds from March through August, and is most active while hunting during dawn and dusk.

Burrowing owls are considered migratory and could likely nest, fly over, or forage in the specific plan area during most years. A single burrowing owl was observed perched near a burrow on the east side of O'Hara Avenue in the south part of the study area. A number of ground squirrel burrows were observed elsewhere within the site along the edges of the fields and roads, however, no burrowing owls or signs of owls (i.e., whitewash, pellets, feathers) were observed in any of the burrows. There are several occurrences of nesting burrowing owl in the CNDDB (2007) in the area, including a few occurrences within 1 mile of the study area. The HCP/NCCP (Jones & Stokes, 2006) identifies a few areas within the plan area as low use burrowing owl habitat.

TRICOLORED BLACKBIRD: The tricolored blackbird is a State of California Species of Concern and is also protected by the federal Migratory Bird Treaty Act. Tricolors are colonial nesters requiring very dense stands of emergent wetland vegetation and/or dense thickets of wild rose or blackberries adjacent to open water for nesting. This species is endemic to California. The only occurrence of nesting tricolored blackbird recorded in the CNDDB (2007) within the Brentwood topographic quadrangle is approximately 4 miles southwest of the study area. The HCP/NCCP (Jones & Stokes, 2006) identifies Marsh Creek as suitable core habitat and a few grassland areas in the plan area as primary or secondary tricolored blackbird foraging habitat.

No tricolored blackbirds were observed nesting, foraging or perching within the project site during the 2007 surveys. However, tricolored blackbirds likely fly over or forage in the project area on occasion. There are some small patches of suitable nesting habitat for this species within Marsh Creek. Beyond a few patches of cattails, tules, and wild rose in Marsh Creek that are considered marginal for nesting tricolored blackbirds, there is no suitable tricolored blackbird nest habitat in the plan area. Due to limited habitat, surrounding urbanization, and high levels of noise disturbance, the likelihood tricolored blackbirds nesting in the specific plan area is considered low.

VALLEY ELDERBERRY LONGHORN BEETLE: The Valley elderberry longhorn beetle (VELB) is listed as a federally threatened species and its host plant is the blue elderberry shrub. The United States Fish and Wildlife Service (USFWS, 1999) *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* identifies stems in excess of 1 inch diameter at ground level as potential habitat for the beetle. These guidelines direct that, if possible, elderberry shrubs should be avoided by a ground disturbance set back of at least twenty feet from the drip line of each shrub. The guidelines further directs that buffer areas between 20 and 100 feet from the driplines of the shrubs that are subject to temporary ground disturbance should be restored or re-vegetated. Although USFWS announced in early-October 2006 that the species likely will be de-listed, VELB remains protected until the formal de-listing process is completed.

There are no records of valley elderberry longhorn beetle recorded in the CNDDB (2007) in the Brentwood topographic quadrangle and the specific plan area is believed to be in the extreme west part or just outside of the species' range. Only the extreme east edge of the HCP/NCCP area extends into the perceived species' range, there are existing mitigation programs and banks available to mitigate potential impacts to VELB, and take of VELB in the HCP/NCCP area is identified as questionable (Jones & Stokes, 2006). The HCP/NCCP does not provide take coverage for valley elderberry longhorn beetle.

Only a few blue elderberry shrubs were observed in the site. These shrubs are along a future off-site utility corridor just west of the north part of the specific plan area (Figure 4 and attached photographs). The shrubs are along the fence lines of a few ruderal grassland fields that the corridor passes between. It is not clear if these shrubs will be directly affected by construction of underground pipelines in this area. No other blue elderberry shrubs were observed in the specific plan area or off-site corridors, although it is possible there are additional blue elderberry shrubs in some areas that could not be comprehensively inspected due to access limitations.

Of the remaining wildlife species identified in the CNDDB search or the HCP/NCCP, the potential for occurrence on site is considered low to none, primarily due to lack of habitat. For example, the lack of vernal pools precludes the potential occurrence of listed vernal pool invertebrates (i.e., fairy shrimp and California tiger salamander). Due to channelization, high levels of maintenance and associated lack of emergent vegetation, Marsh Creek does not provide suitable habitat for western pond turtle and giant garter snake. While some of the birds listed in Table 3 may occasionally fly over or forage in the site, the site does not provide nesting habitat for most of these species.

Discussion, Conclusions, and Recommendations

- The majority of the specific plan area and off-site corridors consist of biologically unremarkable developed areas, orchards, vineyards, row crops, and upland grassland and ruderal grassland fields.

- Marsh Creek flows through the site and is tributary to the San Joaquin River, which is a navigable Water of the U.S. This tributary relationship with navigable Waters of the U.S. forms the basis for Marsh Creek falling under the jurisdiction of agencies including ACOE, CDFG, and RWQCB.

- As ACOE and the U.S. Environmental Protection Agency hold the authority to determine jurisdiction or non-jurisdiction, a wetland delineation, based on current regulations of ACOE, would need to be submitted to ACOE for verification to determine the extent of jurisdictional Waters of the U.S. in the specific plan area with certainty.

- If fill (i.e., culverts, outfall structures, road crossings, channel realignment, etc.) is to be placed within Marsh Creek as a part of

the project, permits may need to be secured from agencies including ACOE, CDFG and RWQCB. It is anticipated that improvement of the Brentwood Boulevard bridge over Marsh Creek will generate impacts to Marsh Creek that trigger permits.

- The likelihood of occurrence of listed, candidate, and other sensitive plants within the developed areas, orchards, vineyards, row crops, and upland grassland and ruderal grassland fields, or Marsh Creek is considered very low to none.

- The likelihood of occurrence of sensitive wildlife species in the project site is considered generally low. Other than Swainson's hawk, burrowing owl, tricolored blackbird, and valley elderberry longhorn beetle, sensitive wildlife species are not expected to occur on more than an occasional or transitory basis. There is no suitable vernal pool or seasonal wetland habitat in the site for sensitive vernal pool invertebrates or California tiger salamander. Due to channelization, high levels of maintenance and associated lack of emergent vegetation, Marsh Creek does not provide suitable habitat for western pond turtle or California red-legged frog.

- The developed areas, vineyards, and orchards that cover much of the specific plan area are not suitable foraging habitat for Swainson's hawk. In contrast, the grassland and annual croplands in the site and surrounding areas are moderately suitable for foraging Swainson's hawk and are likely used by Swainson's hawks during some years. Development of portions of the project site will result in a minor loss of potential Swainson's hawk foraging habitat. However, as the HCP/NCCP does not identify any part of the plan area as suitable foraging habitat for Swainson's hawk, the potential foraging values are recognized as minimal.

- Swainson's hawk could be adversely affected by site construction if they nested in trees in or near the specific plan area prior to the onset of construction. There is suitable nesting habitat within and adjacent to the plan area for Swainson's hawks. Pre-construction surveys within 0.5 miles of the project site are recommended prior to construction activities between March 1 and August 15. In the event that a Swainson's hawk nest is located within 0.5 miles of the project site, temporal construction restrictions may be necessary to eliminate the potential for noise disturbance to nesting hawks.

- There is at least one burrowing owl currently occupying the specific plan area. It is considered possible that this species could nest in the area in the future. Preconstruction surveys are recommended for construction activities between February 1 and August 31. In the event that nesting owls are located within 250 feet of the project site, temporal construction restrictions may be necessary to eliminate the potential for noise disturbance to the burrowing owls.

- The project's participation in the HCP/NCCP will provide a mechanism to mitigate impacts to all potentially occurring sensitive species in the specific plan area and off-site corridors except VELB. In summary, the HCP/NCCP requires payment of per-acre fees, project level surveys (i.e., "planning surveys") that help identify appropriate pre-construction surveys, and if needed, construction monitoring.

- Prior to issuance of a grading or construction permit for future projects within the Specific Plan area, the project applicant will submit an HCP/NCCP "Application Package" to the City of Brentwood. This package will include detailed information on cover types within the project area, and will describe the applicable pre-construction surveys, and if needed, construction monitoring that

will be undertaken. Once the package is deemed complete and per-acre fees are paid, the City will verify that the HCP/NCCP permit terms and conditions have been met and issue take authorization under the HCP/NCCP.

- The potential occurrence of valley elderberry longhorn beetle the elderberry shrubs long the future utility corridor is considered unlikely as the specific plan area is believed to be in the extreme west part or just outside of the species' range. However, absence cannot be determined with certainty through a visual inspection of the shrub. Due to this uncertainty, disturbance to the elderberry shrubs long the future utility corridor should be avoided, if feasible, by restricting ground disturbance activities within 20 feet of the drip line of the shrubs. If avoidance of one or more of the elderberry shrubs is infeasible, consultation with USFWS is recommended to determine if authorization is needed to remove the shrubs. Although USFWS announced in early-October 2006 that the species will likely be de-listed, VELB remains protected until the formal de-listing process is completed. The duration of the de-listing process is not known. Therefore, mitigation measures attached to the project related to VELB should be broad enough to allow for the scenario that the species is de-listed prior to construction.

- Trees within the specific plan area are likely used by nesting raptors and other migratory birds each year. Any of the trees that need to be removed to accommodate site development should be felled between September 1 and January 31, which is outside of the general avian nesting season. Alternately, a pre-construction survey for nesting migratory birds should be conducted prior to tree removal between February 1 and August 31. If active nests are located, tree felling should be delayed until the young fledge.

Thank you, again, for asking Moore Biological Consultants to conduct this work. Please feel free to call me at (209) 745-1159 with any questions.

Sincerely,

Diane S. Moore, M.S.
Principal Biologist

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OFF-SITE BIKE PATH AND UTILITY CORRIDORS

Figure 11
Bikeway Routes Map

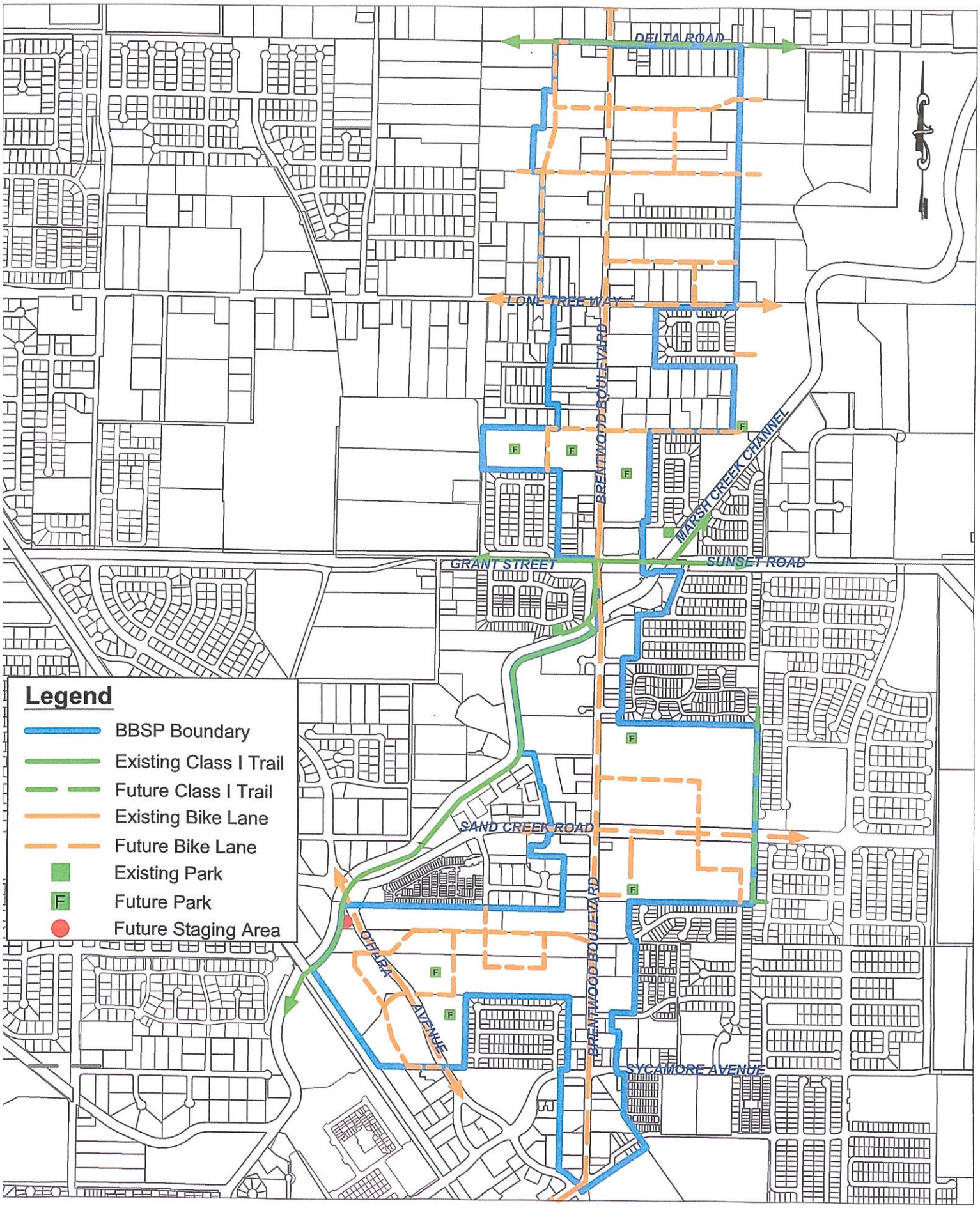


Figure 12a
Northern and Central Sub-Area Utility Map

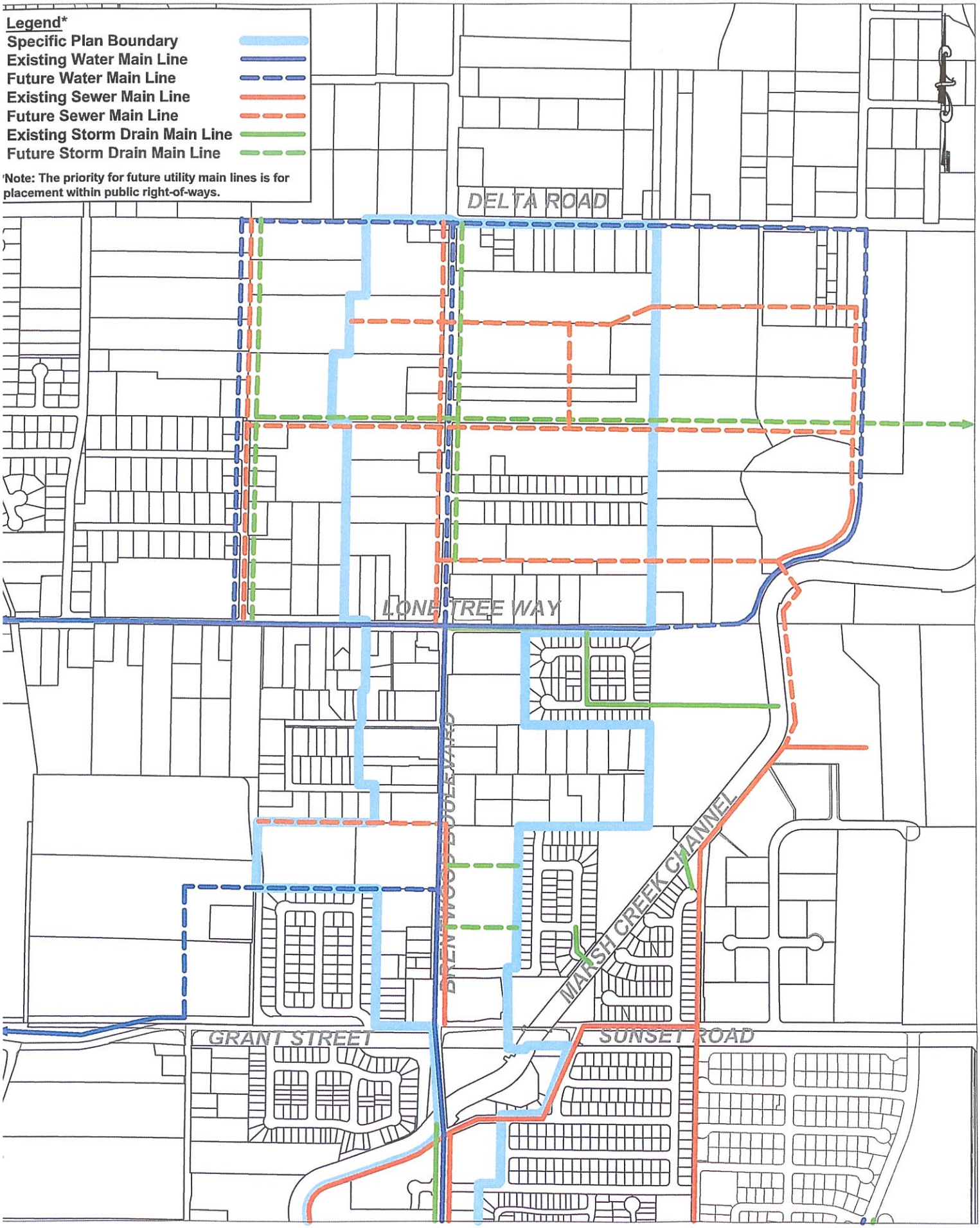
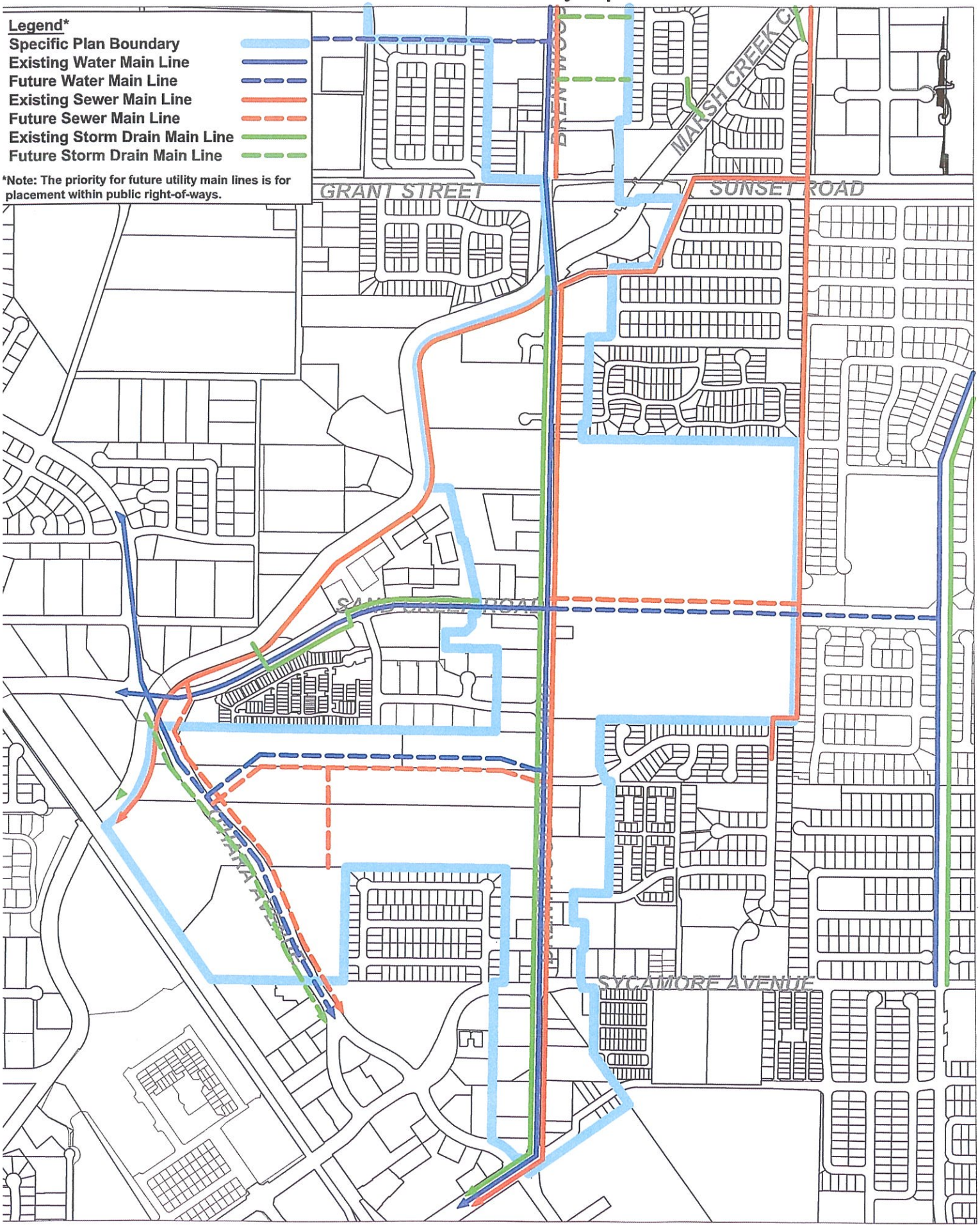


Figure 12b
Southern Sub-Area Utility Map

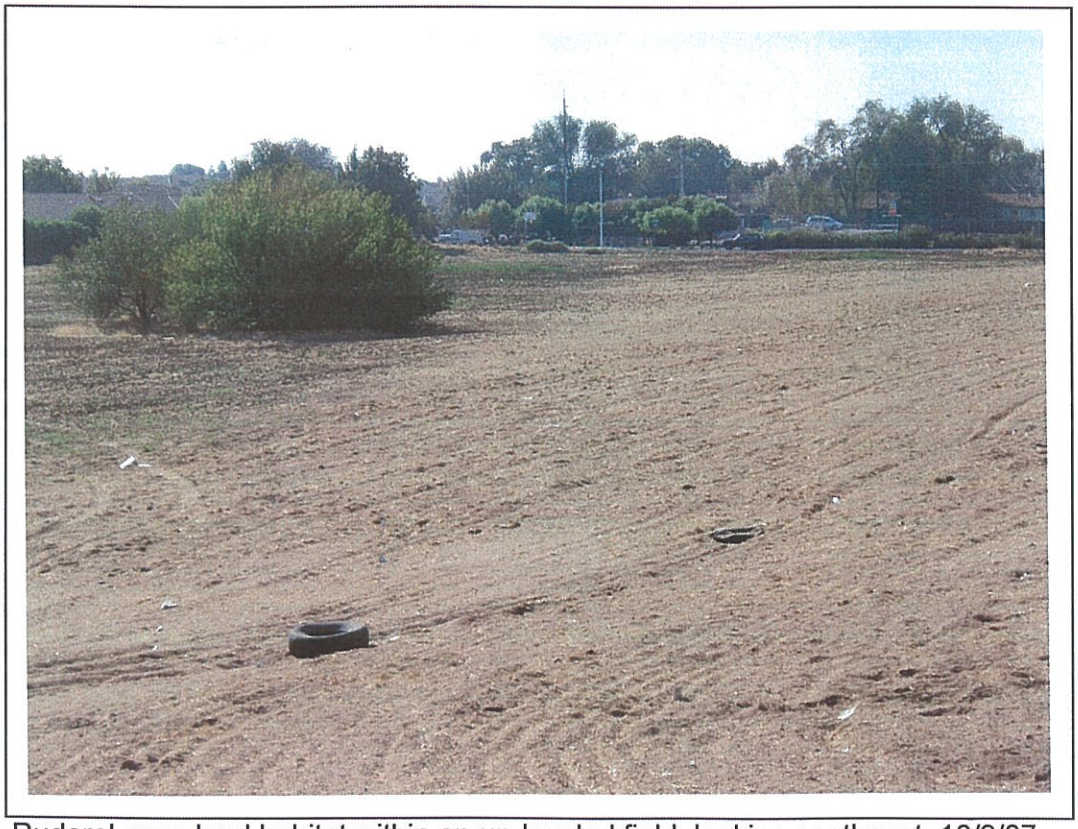


PHOTOGRAPHS

Ruderal grassland habitat within an historical orchard, looking southwest; 10/9/07.

Vineyard in the northeast part of the Specific Plan area, looking northeast; 10/9/07.

Ruderal grassland in a formerly irrigated leveled field, looking southeast; 10/9/07.



Ruderal grassland habitat within an un-leveled field, looking southeast; 10/9/07.

Cropland (row crops) with orchards in the background, looking southwest; 10/9/07.

Marsh Creek at the crossing of a future sewer line, looking south; 10/9/07.

Brentwood Boulevard bridge at Marsh Creek, looking southwest (upstream); 10/9/07.

Brentwood Boulevard bridge at Marsh Creek, looking northeast (downstream); 10/9/07.

Burrowing owl along the east side of O'Hara Avenue, looking northwest; 10/9/07.

Blue elderberry shrub in a future off-site utility corridor, looking northeast; 10/9/07.

APPENDIX J

holman & ASSOCIATES
Archaeological Consultants
"SINCE THE BEGINNING"
3615 FOLSOM ST. SAN FRANCISCO, CALIFORNIA 94110 415/550-7286

Nick Pappani
Raney Planning and Management
1401 Halyard Drive, Suite 120
West Sacramento, CA 95691

October 12, 2007

Dear Mr. Pappani:

RE: REVISED SAMPLING PLAN FOR CULTURAL RESOURCES FOR THE BRENTWOOD BOULEVARD SPECIFIC PLAN AREA

I have gone over my notes and maps provided by the City and have the following proposal to make. It is understood that the City can't arrange access to all the parcels being considered under the Specific Plan, and that cultural resource studies will be done on an application by application basis.

In our last conversation with the City Winston suggested that I come up with a sampling strategy which would consist of looking at only a percentage of the parcels based upon their archaeological sensitivity. I discussed two factors which affect archaeological sensitivity in the Specific Plan area: the first is the riparian zone around Marsh Creek, a favored prehistoric habitat of Native Americans. The second is the area of high dunes in the northern portion of the Specific Plan area.

Most, if not all of the major Native American villages in eastern Contra Costa County are located within or immediately adjacent to the riparian zones bordering the creeks. Large seasonal villages were situated in these areas because of the wide range of animal and plant resources found around the creeks. Fish, turtles, fresh water shellfish and birds were major sources of protein. The creeks also attracted the larger game animals (deer, antelope and elk) which rounded out the Native diet.

The nearby dune areas also appear to have been a favored habitation area of the Native Americans, who used the raised dunes for habitation sites (villages) and for both funerary sites and for other specific purposes. There are a number of villages recorded north of Brentwood in the Oakley area and on Bethel Island which have been excavated beginning in the mid 20th century and recently. Some of these archaeological sites appear to have been ritually used for burial of the dead, while others appear to have been used seasonally for the manufacture of specific types of stone tools and for the consumption of specific foods (mainly small mammals

and birds) caught in the immediate vicinity. Others, most notably the Hotchkiss Mound located north of Brentwood, served as a major habitation village for several thousand years–all the raised dunes had the added attraction of being habitable even during the frequent flooding experienced in northeastern Contra Costa County.

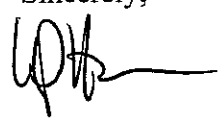
With this in mind I am recommending that a series of parcels be visually inspected in their entirety as they come up for development. The first group of parcels, found in the potentially most sensitive area, are clustered around the banks of Marsh Creek. These are the larger parcels in this area, and thus should give us a good idea if cultural resources are to be found there. They are parcels 016-130-006,007, 020, 019 and 016-110-012 and 030.

What I call the center and northern parts of the Specific Plan area are situated in zones which could have been inhabited when flooding forced the native population out of the riparian zone to the south. I am recommending a survey of the larger parcels for these areas as well: they are 018-170-003 and 018-190-018. There are two other parcels located at the northern end of the Specific Plan area which would also have been preferred habitat during flooding episodes which should be inspected. These are 018-280-018 and 018-270-004.

Inspection of the parcels listed above will give us a much better idea of what may or may not be found on the adjacent parcels. If no cultural resources are discovered during surveys of these properties, it can be safely assumed that no cultural resources will be found inside the neighboring unsurveyed parcels.

If, however, cultural resources are discovered inside any of the parcels listed above, the program of selective inspection for cultural resources may have to be re-evaluated. Additional parcels, based on their proximity to newly recorded archaeological deposits, may thus be considered to be archaeologically sensitive and worthy of visual field inspections as they come up for development.

Sincerely,



Miley Paul Holman
Holman & Associates

Nick

I re-read my original proposal and I have to agree that it was in need of some clarification and a general clean-up. So I cleaned it up, and I hope I have answered your questions about why I selected the parcels I did.

I can't go any further with this in terms of justification however, nor do I feel that the number of parcels could be reduced if the aim is looking at a representative sample. If you or the City want an independent opinion about what should be surveyed out there, the Northwest Information Center does just that. They are normally very conservative about recommending surveys, since they do it based on what they know is recorded in similar environmental settings and based upon their interpretation of the environment even lacking records–basically, is the development area located in a zone favored by the Native Americans. It would be interesting to see

As I allude to in my proposal, the similar environmental setting the Information Center would look at are the indurated sand dunes found in Antioch, Brentwood, Oakley, Bethel Island and elsewhere in norther Contra Costa County. In the past year I have done several surveys in the county based on NWIC recommendations for surveys based upon the presence of the raised dunes themselves. Many other surveys have been recommended and carried out by other archaeologists in the same general area.

Miley

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Nick Pappani
Raney Planning and Management
1401 Halyard Drive Suite 120
West Sacramento, CA 95691

July 11, 2007

Dear Mr. Pappani:

RE: RESULTS OF AN ARCHAEOLOGICAL LITERATURE REVIEW FOR THE BRENTWOOD BOULEVARD SPECIFIC PLAN IMPROVEMENT AREA, BRENTWOOD, CONTRA COSTA COUNTY, CALIFORNIA

At your request I have completed an archaeological literature review for the above road improvement project area located in Brentwood, Contra Costa County. The literature review revealed that very little of the project area has been previously inspected for cultural resources, and that there are currently no historic or prehistoric archaeological resources recorded inside the improvement area borders. This report contains a summary of information gained to date along with recommendations for completion of an archaeological field inspection.

PROJECT DESCRIPTION

According to maps and project descriptions provided by the City of Brentwood, improvements to the existing route of Brentwood Boulevard will occur within a maximum of a 140 foot right of way running from Delta Road in the north to Spruce Street in the south in the center of historic Brentwood. Currently approximately half of the bordering parcels have been developed, either in the last half of the 20th century or more recently; the remainder of the properties bordering Brentwood Boulevard are remnant vineyards and/or open fields.

LITERATURE REVIEW

An archaeological literature review was conducted by this author in person at the Northwest Information Center (NWIC) located at Sonoma State University on June 15, 2007 (file no. 06-1982). Maps and records on file indicated that there were no recorded historic or prehistoric cultural resources inside the 140 foot right of way of the project area or within a thousand feet of it. In addition, there have been almost no formally recorded archaeological field studies of the roadway or the adjacent parcels, contrary to the memory of this author. Exactly two

studies have been done along the project route. In 2004, William Self Associates conducted a survey of a 2.74 acre parcel located at the corner of Brentwood Boulevard and Nancy Lane. In 1991 the Anthropological Studies Center of Sonoma State University surveyed a small portion of the roadway where one of the proposed Los Vaqueros Water Conveyance alignments crossed it.

In addition to conducting the literature review, this author conducted a windshield survey of the project route during the last week of June, 2007 to gain an appreciation of how much of the expansion area inside the 140 foot right of way can be surveyed visually.

In fact over half of the project area expansion zone is currently open land, containing the remnants of former agricultural activities. This stretch of Brentwood Boulevard is crossed by Marsh Creek near its northern end, and is comprised of the raised eroded sand dunes which are found north of the historic downtown of Brentwood.

FINDINGS/RECOMMENDATIONS

It is the opinion of this author that the proposed improvement area is located in an area of moderate to high archaeological sensitivity, based upon its environmental setting: the only currently know Native American settlements located in the Brentwood area which are visible from the existing surface are those found several miles to the southwest, where the combination of the creek environments (Marsh and Sand Creeks) and dry ground above the flood plain made them ideal settlement areas. Archaeological surveys done between the John Marsh State Park and downtown Brentwood have failed to discover archaeological materials on the surface of what was in many places a flood plain: recent work has demonstrated that archaeological resources have been and are expected to be found buried under as much as 3 meters of silt materials.

The current project area, because of its raised elevations, does have the potential for containing archaeological resource deposits on or very near the existing surface. It is the recommendation of this report that a comprehensive surface survey be done of the entire road right of way where existing improvements have not yet covered the ground.

In the event that field survey identifies prehistoric archaeological deposits, additional research should be done prior to formal recording of the resource to determine if there is any actual depth to the deposit in the area of surface discoveries. Culturally modified soils (midden) may contain additional artifactual material, concentrations of stone, bone and/or shellfish, evidence of fire (ash, charcoal, fire affected earth or rock), and of course, human burials.

In the event that it is determined that future roadway improvements will impact potentially significant cultural deposits, a proposal for the evaluation of the resource under current CEQA guidelines should be submitted to the City of Brentwood for approval. Evaluation is normally done by a limited program of hand excavation into the area of suspected midden deposit to evaluate the contents for eligibility for placement on the California Register of Historic Resources (CRHR).

If it is determined that a CRHR resource will be impacted by planned improvements, a program of mitigation of impacts should be submitted to the City for approval before construction related grading or trenching is allowed to commence inside the area designated as archaeologically sensitive.

Mitigation can take the form of additional data retrieval through hand excavation coupled with archaeological monitoring of all earthmoving to insure that all significant archaeological material and/or materials have been recorded and/or removed for subsequent analysis before work is allowed to recommence. Monitoring also acts to help limit damage to human burials; after notification of the County Coroner's Office and the Native American Heritage Commission (responsible for naming a Most Likely Descendant), human remains and associated grave goods can be removed and reburied off-site after recommendations have been obtained from the Most Likely Descendant.

Sincerely,

Miley Paul Holman
Holman & Associates

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William Self Associates
2004 Archaeological Survey and Cultural Resources Assessment of parcel at Brentwood Boulevard and Nancy Lane (APN-016-170-009), Brentwood, Contra Costa County, California. On file, NWIC file no. S-29584

APPENDIX K

I. SUMMARY

The purpose of this report is to identify potential historic buildings that could be affected by the Brentwood Boulevard Specific Plan. The historic buildings survey area included only parcels adjacent to Brentwood Boulevard (the entire Specific Plan area includes streets perpendicular to Brentwood Boulevard not included in the historic building survey). A "windshield" or reconnaissance survey of the project area was conducted by architectural historian Ward Hill (M.A. Architectural History, University of Virginia, 1983) during the week September 23, 2007 to identify properties potentially eligible for the California Register of Historical Resources.

Properties eligible for the California Register are considered to be historic resources for purposes of compliance with the California Environmental Quality Act (CEQA). The survey identified a total of 75 buildings in the Brentwood Boulevard Specific Plan survey area. 26 buildings in the survey area appear to be over 50 years old (Pre-1957); 11 of these buildings may be eligible for the California Register with historical research. The research would be to determine potential eligibility under California Register Criteria 1 and 2 (described in Section II below). The methodology and coding system for the survey are presented in Section III and the results of the survey area are included in the attached spreadsheets.

II. REGULATORY FRAMEWORK: THE CALIFORNIA REGISTER OF HISTORICAL RESOURCES

In September 1992, Governor Wilson signed Assembly Bill 2881 which created more specific guidelines for identifying historic resources during the project review process under the California Environmental Quality Act (CEQA):

> A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. For purposes of this section, an historical resource is a resource listed in, or determined eligible for listing in, the California Register of Historical Resources.[1]

Consequently, under Section 21084.1 of the Public Resources Code, an historic resource eligible for the California Register would by definition be an historic resource for purposes of CEQA compliance. The regulations for nominating resources to the California Register were published January 1, 1998. Under the regulations, a number of historic resources are automatically eligible for the California Register if they have been listed under various state, national or local historic resource criteria. California historic resources listed in, or formally determined eligible for the National Register of Historic Places are automatically listed on the California Register.

[1] California State Assembly, Assembly Bill 2881, Frazee, 1992. An Act to Amend Sections 5020.1, 5020.4, 5020.5, 5024.6 and 21084 of, and to add Sections 5020.7, 5024.1, and 21084.1 to, the Public Resources Code, relating to historic resources.

In order for a resource to be eligible for the California Register, it must satisfy all of the following three criteria:

A. A property must be significant at the local, state or national level, under one or more of the following four criteria of significance (these are essentially the same as National Register criteria with more emphasis on California history):

1. the resource is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history and cultural heritage of California or the United States.

2. the resource is associated with the lives of persons important to the nation or to California's past.

3. the resource embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values.

4. the resource has the potential to yield information important to the prehistory or history of the state or the nation (this criteria applies primarily to archaeological sites).

B. the resource retains historic integrity (defined below); and,

C. it is 50 years old or older (except for certain cases described in the California Register regulations).

The California Register regulations define "integrity" as ". . . the authenticity of a property's physical identity, evidenced by the survival of characteristics that existed during the property's period of significance," that is, it must retain enough of its historic character or appearance to be recognizable as an historical resource. Following the National Register integrity criteria, California Register regulations specify that integrity is a quality that applies to historic resources in seven ways: location, design, setting, materials, workmanship, feeling and association.[2] A property must retain most of these qualities to possess integrity, although one of the qualities of integrity may be more important than another depending on why the resource is significant.

[2]. The definition of integrity under the California Register follows National Register of Historic Places criteria. Detailed definitions of the qualities of historic integrity are in National Register Bulletin 15, *How to Apply National Register Criteria for Evaluation*, published by the National Park Service.

III. RECONNAISSANCE FIELD SURVEY

A. Methodology - Reconnaissance Survey Ratings

During the Reconnaissance Survey (the Survey) conducted in September 2007, the buildings in the project area were assigned a rating from 1 to 5 based on visual qualities, age and historic integrity. Ratings 1 to 4 are only assigned to buildings in the survey area that appear to be over 50 years old (Pre-1957). The following describes the five ratings used in the survey.

1 = Retains historic integrity and may be eligible for the California Register based on visual qualities alone.

2 = Retains historic integrity and but needs further research to determine eligibility. The research would be to determine potential eligibility under California Register Criteria 1 and 2. The level of research would vary depending on the property. The research could involve determining the history of the business or businesses in a building or identifying who lived in the houses, what they did for a living, etc. Houses historically (50 years or more) occupied primarily by tenants can usually be considered ineligible, under Criteria 2, given the likelihood that the renters would not stay for a substantial period of time. The business or industrial buildings often take more time than houses.

3 = Retains sufficient historic integrity based on an initial site reconnaissance but not likely to be eligible for the California Register.

4 = Historic integrity compromised, thus does not appear eligible for the California Register.

5 = Appears to be less than 50 years old.

The survey identified a total of 75 buildings (or building complexes at a particular address) in the Brentwood Boulevard Specific Plan survey area; 26 buildings in the survey area appear to be over 50 years old (Pre-1957). The survey identified no buildings with a rating of "1"; 11 buildings with a rating of "2"; 10 buildings with a rating of "3"; and 5 buildings with a rating of "4."

The Summary column has codes providing more information on the buildings included in the Survey. The codes provide the additional data in the following order for the only pre-1957 buildings: number of stories, the building use (i.e. residential, commercial etc.), estimated construction date and architectural style (if apparent). For example, a *1(R) 1920 B* refers to a single story (1), residential building (R) with an estimated construction date of 1920 in the Bungalow Style (B). Additional information regarding building use, current occupants, etc. is sometimes provided in the Summary column. For buildings with a "5" rating (less than 50 years old), the survey identifies in the Summary column the building's general use and/or the identity of a major occupant.

The following codes were used for the Reconnaissance Survey.

Building Use

R = residential (one or two units)
Apt = Apartment (over two units)
C = Commercial (office, retail)
Ind. = Industrial

Architectural Style

B = Bungalow
Col = Colonial Revival
SP = Spanish Colonial Revival
QA = Queen Anne
Ital = Italianate
Mod = Modern
Ranch = Ranch House Style
Ind = industrial vernacular

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United States Department of Interior, National Park Service

1994 National Register Bulletin 15 - Guidelines for Applying National Register Criteria for Evaluation.

United States Department of Interior, National Park Service

1991 National Register Bulletin 16 & 16A - Guidelines for Completing National Register of Historic Places forms.

APPENDIX L

BBSP DEIR – Acronyms and Technical Terms

AB – Assembly Bill
ABAG – Association of Bay Area Governments
ACM – Asbestos-Containing Material
AF/Yr – Acre-Feet Per Year
AST – Aboveground Storage Tank
AWSC – All-Way Stop-Controlled
BAAQMD – Bay Area Air Quality Management District
BBSP – Brentwood Boulevard Specific Plan
BOD – Biochemical Oxygen Demand
BWTP – Brentwood Water Treatment Plant
Cal-EPA – California Environmental Protection Agency
CARB – California Air Resources Board
CBC – California Building Standards Code
CCAA – California Clean Air Act
CCCFCWCD – Contra Costa County Flood Control and Water Conservation District
CCR – California Code of Regulations
CCTA – Contra Costa Transportation Authority
CCWD – Contra Costa Water District
CDFG – California Department of Fish and Game
CEC – California Energy Commission
CEQA – California Environmental Quality Act
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
CFR – Code of Federal Regulations
CMA – Congestion Management Agency
CMP – Congestion Management Program
CMUTCD – California Manual on Uniform Traffic Control Devices
CNDDB – California Natural Diversity Database
CNEL - Community Noise Equivalent Level (24-hour average noise level with noise occurring during evening hours (7-10 p.m.) weighted by a factor of three and noise occurring during nighttime hours (10 p.m.-7 a.m.) weighted by a factor of 10, prior to averaging.
CO – Carbon Monoxide
COI – Commercial/Office/Industrial
COIR – Commercial/Office/Industrial/Residential
CPUC – California Public Utilities Commission
CRHR – California Register of Historic Resources
CWA – Clean Water Act
DA – Drainage Area
DEIR – Draft Environmental Impact Report
DOT – Department of Transportation
DTSC – Department of Toxic Substance Control
ECCID – East Contra Costa Irrigation District
ECCFPD – East Contra Costa Fire Protection District
EIR – Environmental Impact Report

EMF - Electric and Magnetic Fields
FEIR – Final Environmental Impact Report
FHWA – Federal Highway Administration
FSWA – Federal Safe Drinking Water Act
GCC – Global Climate Change
GHG – Greenhouse Gases
GMP – Growth Management Program
GP – General Plan
HCD – Housing and Community Development
HCP/NCCP – Habitat Conservation Plan/Natural Community Conservation Plan
HCM – Highway Capacity Manual
HGL – Hydraulic Grade Lines
HSC – Health and Safety Code
HVAC – Heating, Air Conditioning, and Ventilation Equipment
HWCL – Hazardous Waste Control Law
ICU – Intersection Capacity Utilization
IPCC – Intergovernmental Panel on Climate Change
ITE – Institute of Transportation Engineers
LAFCo – Local Agency Formation Commission
Ldn - Day/Night Average Sound Level (Similar to CNEL but with no evening weighting)
Leq - Equivalent or energy-averaged sound level
LOS – Level of Service
LUST – Leaking Underground Storage Tank
MGD – Million Gallons Per Day
MSL – Mean Sea Level
MSR – Municipal Service Review
MSW – Municipal Solid Waste
NAAQS – National Ambient Air Quality Standards
NAHC – Native American Heritage Commission
NFRAP – No Further Remedial Action Planned
NHPA – National Historic Preservation Act
NIH – National Institute of Health
NOP – Notice of Preparation
NO_X – Nitrogen Oxide
NPDES – National Pollutant Discharge Elimination System
NPL – National Priorities List
NRHP – National Register of Historic Properties
NWIC – Northwest Information Center
OAL – Office of Administrative Law
OHWM – Ordinary High Water Mark
OPR – Office of Planning and Research
OSHA – Occupational Safety and Health Administration
PAHS – Polynuclear Aromatic Hydrocarbons
PCB – Polychlorinated Biphenyls
PG & E – Pacific Gas and Electric Company
$PM_{2.5}$ – Particulate matter 2.5 micrometers in diameter and smaller